U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management

Draft

Medford District Office — September 1983

Medford Grazing Management Program

Environmental Impact Statement

United States Department of the Interior

BUREAU OF LAND MANAGEMENT

MEDFORD DISTRICT OFFICE
3040 Biddle Road
Medford, Oregon 97504

Enclosed for your review and comment is the Medford Grazing Management Draft Environmental Impact Statement (EIS). The statement analyzes the impacts that would result from four alternative livestock grazing management programs. The purpose of the statement is to present environmental, technical, economic and social information for use in the decisionmaking process.

Comments concerning the adequacy of this statement will be considered in preparing the final environmental impact statement. The comment period will end December 30, 1983. An informal meeting to answer questions on the draft EIS will be held at 7:30 p.m., November 16, 1983, in Medford, Oregon, at the Bureau of Land Management, Medford District Office. Bureau of Land Management personnel will be available to answer questions regarding the draft EIS analysis.

The draft EIS may be incorporated into the final EIS by reference only. The final EIS then would consist of public comments and responses and any needed changes of the draft. Therefore, please retain this draft EIS for use with the final.

Comments received after the close of the comment period will be considered in the decision process, even though they may be too late to be specifically addressed in the final environmental impact statement. Your comments on the draft EIS should be sent to:

District Manager
Bureau of Land Management
3040 Biddle Road
Medford, Oregon 97504

Sincerely yours,

Hugh R. Shera

District Manager

U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management

Draft Environmental Impact Statement

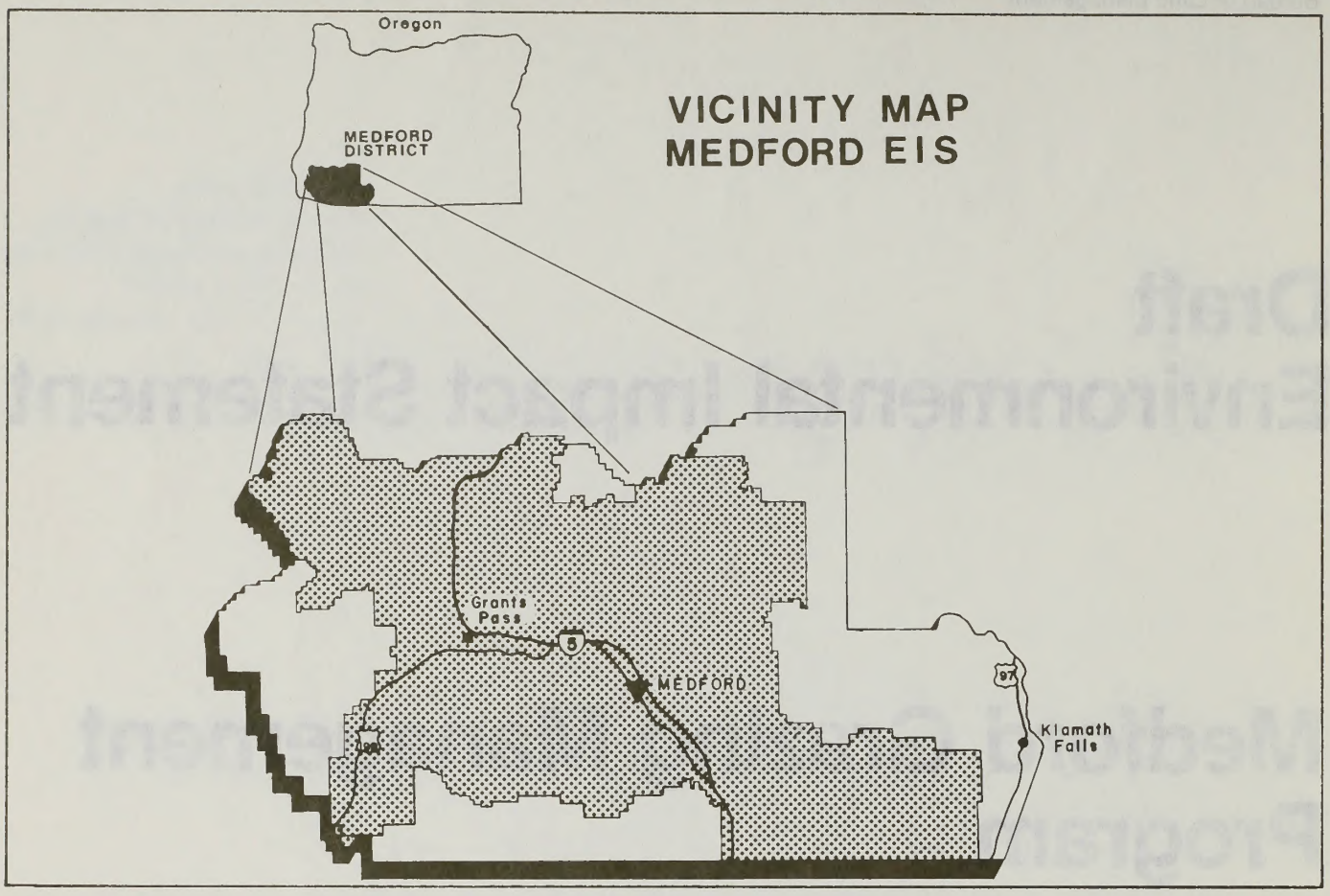
Medford Grazing Management Program

Prepared by

Bureau of Land Management
U.S. Department of the Interior
1983

William D. Leavell
State Director, Oregon State Office

MEDFORD PROPOSED GRAZING MANAGEMENT



Draft (x) Final ( ) Environmental Impact Statement
Department of the Interior, Bureau of Land Management

- **Type of Action: Administrative (x) Legislative ( )**

- **Abstract:** The Bureau of Land Management proposes to implement a livestock grazing management program on approximately 397,000 acres (109 allotments) of public land in southern Oregon. Unallotted status would continue on approximately 516,000 acres. Proposed alternatives include allocation of forage to livestock, wild horses, wildlife and nonconsumptive uses; establishment of grazing systems; and construction of range improvements.

- **Alternatives analyzed:**
- Alternative 1, No Action
- Alternative 2, Emphasize Livestock Grazing
- Alternative 3, Preferred Alternative
- Alternative 4, Emphasize Non-Livestock Values

Range condition would be maintained or improved under Alternatives 2, 3, and 4. Water quality would be improved under Alternatives 3 and 4. Deer, elk and upland game bird populations would be expected to increase under Alternatives 3 and 4. Long term increases in personal income and employment would occur under Alternatives 1, 2 and 3.

The Draft statement would be made available to EPA and the public in late September 1983. The comment period will be 90 days, ending December 30, 1983.

For further information contact: **Joseph Ross, EIS Team Leader**
Bureau of Land Management
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Medford, Oregon 97504
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Summary

This environmental impact statement (EIS) analyzes the impacts of implementing a livestock grazing management program in the Medford EIS area of the Medford District in southwest Oregon. Four alternatives developed through the Bureau planning system and the public scoping process are described and analyzed. The purpose of the proposed alternatives is to present and evaluate options for managing, protecting and enhancing rangeland resources.

The four alternatives and a summary of environmental consequences are described below. Table 1-1, in the text, summarizes the components of the alternatives. Table 1-2, in the text, presents a summary comparison of long-term impacts of the alternatives.

- **Alternative 1, No action -** Alternative 1 would be a continuation of the present grazing management program. Grazing permits would be issued at the 1982 active preference level of 22,496 AUMs. In addition, forage would be allocated in the short term to wildlife (53,182 AUMs), wild horses (250 AUMs), and nonconsumptive uses (56,615 AUMs). No additional range improvements would be developed.

- **Alternative 2, Emphasize Livestock Grazing -** Forage would be allocated in the short term to livestock (41,140 AUMs), wildlife (56,248 AUMs), wild horses (250 AUMs), and nonconsumptive uses (56,615 AUMs). Livestock grazing would be allowed throughout the 397,000-acres presently allotted, except where currently excluded (100 acres). Proposed range improvements include seedings (41,845 acres), brush control and hardwood removal (24,259 acres), fences (193 miles) and water developments (126 developments).

As a result of the proposed range improvements, forage production is expected to increase by 23,005 AUMs. For purposes of analysis, it is assumed that the long-term increase in forage production would be allocated to livestock (19,173 AUMs) and wildlife (3,832 AUMs).

- **Alternative 3, Preferred Alternative -** Grazing systems under Alternative 3 are designed to maintain or improve range and forage conditions to benefit wildlife, wild horses and livestock. Forage would be allocated in the short term to livestock (30,272 AUMs), wildlife (59,214 AUMs) and wild horses (250 AUMs). Nonconsumptive uses would have 56,615 AUMs allocated. Livestock would be excluded from the 100 acres of existing exclusion. Proposed range improvements include seedings (22,030 acres), brush control and hardwood removal (11,468 acres), fences (112.5 miles) and water developments (81 developments).

As a result of the proposed range improvements, forage production is expected to increase by 14,964 AUMs. For purposes of analysis, it is assumed that the increase would be allocated to livestock (8,239 AUMs) and wildlife (6,725 AUMs).

- **Alternative 4, Emphasize Non-Livestock Grazing Values -** Alternative 4 would emphasize non-livestock values where conflicts with livestock grazing have been identified. Forage would be allocated in the short term to livestock (15,646 AUMs), wildlife (71,635 AUMS), wild horses (250 AUMs), and nonconsumptive uses (57,802 AUMs). This alternative would exclude livestock from 73,227 acres in addition to the 100 acres of existing exclusion. Proposed range improvements include 106.4 miles of fences, 116 water developments, 20,474 acres of seeding, and 13,018 acres of brush control and hardwood removal, all to benefit non-livestock values.

As a result of the proposed range improvements and exclusion of livestock from 73,227 acres, forage production for wildlife and nonconsumptive uses is expected to increase by 18,368 AUMs. The long term allocation to livestock is expected to decrease by 6,789 AUMs.

Environmental Consequences

Vegetation

Range and forage conditions would improve under Alternatives 2, 3 and 4 but would continue to decline under Alternative 1. Total residual ground cover would show a slight decrease under Alternative 1, but would remain the same under Alternatives 2, 3 and 4. The proportion of residual ground cover composed of perennial vegetation would increase under Alternatives 2, 3 and 4. Alternative 4, and to a lesser extent, Alternatives 2 and 3, would result in increases in key woody species on streamside riparian areas with medium and high improvement potential. Alternative 1, and to a lesser extent, Alternative 2, would result in decreases in key woody species in some riparian areas where funding contraints precluded development of improvements and systems. The standard procedures and design features for range improvements would prevent impacts to threatened, endangered and sensitive plants. Impacts from other aspects of the grazing management program on these species are unknown.

Soils

The development of range improvements under Alternatives 2, 3 and 4 would temporarily disturb the soil surface. Tractor scarification and burning would temporarily increase soil erosion. These areas would become revegetated within 1 to 2 years following scarification and burning.

Increases in riparian vegetation would help stabilize streambanks and decrease erosion under Alternatives 2, 3, and 4 to varying degrees on the 19 percent of streambank miles identified as having significant livestock damage. This erosion decrease would be most significant under Alternative 4.

Water

No significant change in water yield would occur under any of the alternatives. Water quality (sediment yield, water temperatures, fecal coliform levels) would improve under Alternative 4, and to a lesser extent under Alternative 3.

Wildlife

- The number of small mammals, birds and fish dependent on riparian areas would increase as key riparian plant species and population increase. Conversely, a decrease in populations would be expected as key plant species decrease. Riparian-dependent species would increase most under Alternative 4, and under Alternatives 2 and 3 (to a lesser extent) primarily due to proposed exclusions. These species would decrease under Alternative 1. No appreciable change in these riparian-dependent populations would occur over the long term under Alternative 2.

- Additional livestock exclusions under Alternatives 3 and 4 would increase upland game bird production.

- Deer and elk populations would slightly decline impacted under Alternatives 1 and 2 and increase under Alternatives 3 and 4.

- Populations of cavity dependent species would be reduced or eliminated on 30 percent (Alternative 2); 17 percent (Alternative 3); and 13 percent (Alternative 4) of existing oak-woodlands.

- Under Alternative 1 a decrease in residual ground cover in the upland zones would decrease available cover resulting in a lower population of small animals. Conversely, Alternative 4 would allow increased accumulations of herbaceous litter with resultant increases of small birds, mammals and reptiles.

Wild Horses

Temporary disturbances to wild horses would occur during the period of construction of range improvements under Alternatives 2, 3, and 4. Wild horses would be allocated sufficient forage to provide for a maximum total population of 50 head under all Alternatives.

Recreation

Projected visitor use to 1990 would not be significantly impacted under any alternative. Localized visitor use reductions would be offset by localized increases in visitor use. Under all alternatives, area-wide 1990 visitor use for public lands in the EIS area is projected to increase an estimated 4 percent by 1990. Over the long term, impacts to visitor use would be slightly beneficial under Alternatives 3 and 4 and slightly adverse under Alternatives 1 and 2.

Cultural Resources

Appropriate measures would be taken to identify and protect cultural sites prior to ground-disturbing activities.

Visual Resources

Certain portions of the EIS area may experience slight degradation of visual quality due to contrast created by range improvements. Project design features, as well as visual resource management program procedures and constraints, would mitigate land form and vegetative contrast under all alternatives.

Special Areas

Under Alternative 4, habitat for sensitive plant species would be enhanced within the Eight Dollar Mountain and Table Rocks potential ACECs. Under Alternatives 1, 2 and 3 there would be no impact in these areas. Grazing under all alternatives would not impact any other identified special area.

Timber Resources

Under all alternatives, with cooperative livestock operators; proper season of use; proper stocking levels and distribution of animals; and proper allocation of forage between user groups, seeding and livestock grazing on moderate sites would not conflict with forestry objectives.

Human Health

The possibility of human health being impacted by the use of herbicides is related to the toxicity of the herbicide, the likelihood of exposure, and resulting dosage received. Based on current knowledge and the low risk of exposure on BLM-treated acres, an unreasonable risk to human health from continued, careful use of herbicides is unlikely.

Socioeconomics

Under Alternatives 1, 2, and 3, personal income and employment in Jackson and Klamath Counties would be increased over the long term. A long-term reduction in income and employment would be experienced under Alternative 4. Temporary increases in income and employment due to range improvements would be experienced under Alternatives 2, 3, and 4.

Under Alternative 4, two lessees would experience a long-term loss of forage amounting to more than 10 percent of their annual forage requirements. Under Alternatives 1 and 4 several lessees might experience a reduction in ranch value due to reduced grazing privileges.

Purpose and Need

This environmental impact statement (EIS) analyzes the impacts of implementing a livestock grazing management program on public lands administered by the Bureau of Land Management (BLM) in the Medford District in southwestern Oregon. This area is referred to as the Medford EIS area.

The BLM is responsible for managing livestock grazing on public lands in a manner that would maintain or improve public land resources, including timber, soil, water, vegetation, and wildlife habitat. The BLM's principal authority and direction to manage lands are found in the O&C Act of 1937, Taylor Grazing Act of 1934, Federal Land Policy and Management Act of 1976 (FLPMA), and Public Rangelands Improvement Act of 1978.

The purpose of the proposed alternatives is to present and evaluate options for managing, protecting and enhancing rangeland resources. Four alternative livestock grazing programs are analyzed: No Action, Emphasize Livestock Grazing, the Preferred Alternative, and Emphasize Non-Livestock Values.

The alternatives and issues addressed in this EIS were defined through the BLM's planning system

and a public scoping meeting in Medford, Oregon. See Appendix A for a summary and results of EIS scoping.

The District Manager will review the public comments on both draft and final EISs and prepare a draft Record of Decision within five months after release of the final EIS. The decision may be to select one of the EIS alternatives intact, or to blend features from several alternatives that fall within the range of actions analyzed in the EIS. Significant impacts, alternatives, environmental preferences, economic, and technical considerations will be addressed in the Record of Decision. The Oregon State Director will provide quality control, supervisory review and approval of the final EIS and associated plan.

Chapter 1 Description of the Alternatives

The proposed alternatives prescribe grazing management for 109 allotments on approximately 397,000 acres of public land in the Medford EIS area. Approximately 7,492 acres of State land and 285,536 acres of private land are located within the allotments (Figure 1-1).

Unallotted status (see Glossary) would continue on approximately 516,000 acres of public lands under all alternatives. While some of these areas have been grazed in the past, there is currently no active interest in grazing them as most are unsuitable for grazing. No range improvements, forage allocations or grazing systems are planned on unallotted lands. Because no change from the existing situation is expected on the unallotted areas, they are not discussed further.

The following alternatives are analyzed in this document:

- Alternative 1 No Action
- Alternative 2 Emphasize Livestock Grazing
- Alternative 3 Preferred Alternative
- Alternative 4 Emphasize Non-Livestock Values

The alternatives differ in three components: (1) the allocation of livestock forage (2) the types of grazing systems to be applied and (3) the kind and amount of range improvements to be constructed. Appendices B, C and D contain allotment-specific proposed allocations, grazing systems and range improvements respectively. Table 1-1 summarizes the components of the alternatives.

In forested areas, an objective of all alternatives is coordination of grazing management with timber management objectives. Grazing in forest stands would be planned, controlled and coordinated so that use of the forage resource would not impair the productivity of the land.

Alternative 1 - No Action

Under Alternative 1 a continuation of present grazing management is proposed. No change from present management actions would occur. Grazing leases would continue to be issued at 1982 active preference levels, which are below grazing capacity on 98 allotments (350,506 acres) and above grazing capacity on 11 allotments (46,549 acres). As shown in Table 1-1, the forage allocation would continue at the 1982 level of 22,496 AUMs for livestock, 250 AUMs for wild horses, 53,182 AUMs for wildlife, and 56,615 AUMs for nonconsumptive uses (see Glossary). Allocations by allotment are listed in Appendix B, Table B-1. It is assumed that no additional range improvement projects or intensive grazing management would be

Table 1-1 Summary of Components

	1982 Level	Alt.1 No Action	Alt.2 Emphasize Livestock	Alt.3 Preferred Alternative	Alt. 4 Emphasize Non-livestock
Existing Forage Production (AUMs) [1]	132,543	132,543	132,543	132,543	132,543
Short Term Allocation (AUMs) [2]					
Wildlife	53,182	53,182	56,248	59,214	71,635
Wild Horses	250	250	250	250	250
Nonconsumptive	56,615	56,615	56,615	56,615	56,615
Livestock	22,496	22,496	41,140	30,272	15,646
Long Term Allocation (AUMs) [3]					
Wildlife		52,867	57,014	59,907	71,550
Wild Horses		250	250	250	250
Nonconsumptive		56,615	56,615	56,615	57,802
Livestock		22,266	41,669	30,735	15,707
Long Term Forage Production (AUMs)		131,998	155,548	147,507	145,309
Grazing Systems (acres) [4]					
Winter		387	387	387	95
Spring		91,953	9,933	15,957	34,516
Summer		64,237	49,577	49,577	46,624
Spring/Summer		125,538	82,434	82,434	77,368
Deferred Rotation		54,600	156,356	150,769	68,738
Rest Rotation		58,964	96,992	96,555	95,211
Non-use [5]		1,276	1,276	1,276	1,276
Exclusion		100	100	100	73,227
TOTAL ACRES		397,055	397,055	397,055	397,055
Additional Range Improvements					
Fences (miles)	196	0	193	112.5	106.4
Springs (each)	33	0	68	44	65
Ponds (each)	86	0	58	37	51
Corrals (each)	12	0	18	12	6
Hardwood removal/seed (acres)	0	0	12,577	6,999	5,124
Brush control/seed (acres)	0	0	11,682	4,469	7,894
Meadow seeding (acres)	0	0	3,615	2,474	1,987
Seeding cut-over forested areas (acres)	0	0	6,199	4,789	3,053
Other seeding (acres)	0	0	7,772	3,299	2,416
Total Construction Costs ($000)			1,803	1,004	1,289

[1] Existing forage production is the total amount of forage which could be consumed by livestock on a sustainable basis.
[2] Short term allocation indicates AUMs which are expected to be credited due to implementation.
[3] Long term forage production shows AUMs expected to be produced by end of 15 years following implementation. Long term allocation is an assumption for analytical purposes as to how those AUMs would be allocated.
[4] Existing grazing systems are the same as Alternative 1, No Action.
[5] Includes four allotments (#10, 11, 209, 221) which are currently inactive.

U. S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
MEDFORD DISTRICT

MEDFORD GRAZING MANAGEMENT ENVIRONMENTAL IMPACT STATEMENT

1983

LEGEND

- Bureau of Land Management
- U. S. Forest Service
- State
- Private
- EIS Boundary
- Allotment Boundary

R.10W. R.9W. R.8W. R.7W. R.6W. R.5W. R.4W. R.3W. R.2W. R.1W. R.1E. R.2E. R.3E. R.4E. R.5E. R.6E. R.7½E. R.7E.

T.31S. T.32S. T.33S. T.34S. T.35S. T.36S. T.37S. T.38S. T.39S. T.40S. T.41S. R.7E. R.8E.

COW CREEK, WEST FORK, AZALEA, QUINES CREEK, GLENDALE JUNCTION, GLENDALE, DOUGLAS CO., JOSEPHINE CO., ROGUE, CURRY, JOSEPHINE CO. CO., WOLF CREEK, SUNNY VALLEY, GALICE, JOSEPHINE CO., JACKSON CO., Pleasant Creek, Evans Creek, WIMER, MERLIN, SISKIYOU, NATIONAL FOREST, GRANTS PASS, ROGUE RIVER, GOLD HILL, WILDERVILLE, WONDER, APPLEGATE, MURPHY, SELMA, DRYDEN, Lake Selmac, KERBY, CAVE JUNCTION, HOLLAND, OREGON CAVES NATIONAL MONUMENT, SISKIYOU NATIONAL FOREST, O'BRIEN, ILLINOIS RIVER, FORK ILLINOIS RIVER, OREGON, CALIFORNIA, JOSEPHINE CO., JACKSON CO., COPPER, ROGUE RIVER NATIONAL FOREST, KLAMATH N.F., OREGON, CALIF., UMPQUA NATIONAL FOREST, PROSPECT, ROGUE RIVER NATIONAL FOREST, LOST CREEK RES, METHOD, SHADY COVE, BUTTE FALLS, SAMS VALLEY, EAGLE POINT, BROWNSBORO, WHITE CITY, LAKE CREEK, CENTRAL POINT, MEDFORD, JACKSONVILLE, PROVOLT, APPLEGATE, RUCH, PHOENIX, TALENT, ASHLAND, WILLIAMS, Bear Creek, Emigrant Creek, EMIGRANT RES, HYATT RES, HOWARD PRAIRIE RES, Keene Creek, PINEHURST, JACKSON CO., KLAMATH CO., KLAMATH, ROGUE RIVER, SOUTH FORK, NORTH FORK, Butte Creek, Little Butte Creek, Elk Creek, Grave Creek, Jumpoff Joe Creek, Dead Indian Memorial Road, ROGUE RIVER NATIONAL FOREST, FOURMILE LAKE, WINEMA, LAKE OF THE WOODS, NATIONAL FOREST, ROGUE RIVER, UPPER KLAMATH LAKE, ASPEN LAKE, LONG LAKE VALLEY, ROUND LAKE, KENO, MIDLAND, WORDEN, LAKE MILLER

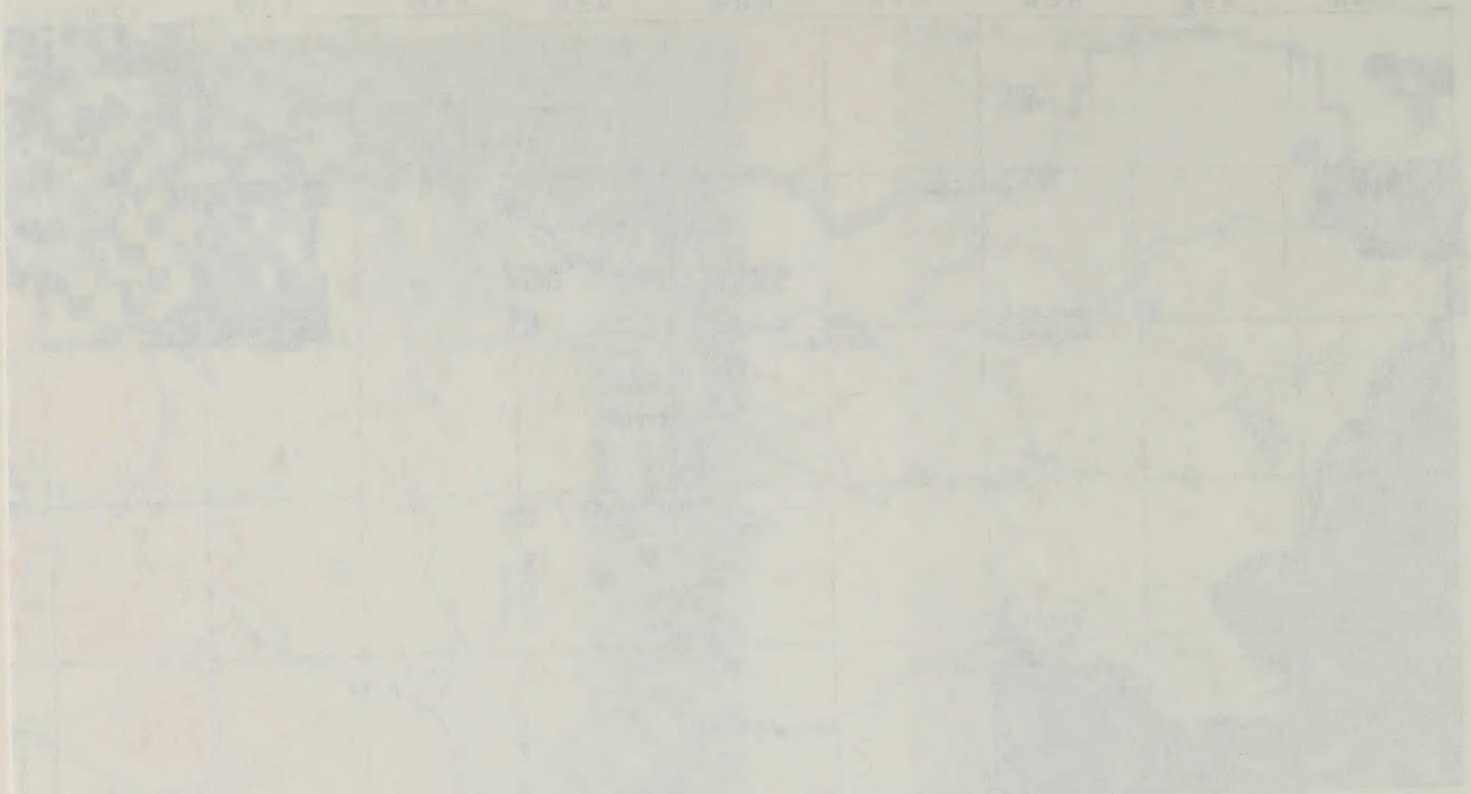
SCALE 5 0 5 10 MILES

ALLOTMENT NUMBERS AND NAMES

001 LOST CREEK
002 FLAT CREEK
003 TRAIL CREEK
004 LONG BRANCH
005 ANTIOCH ROAD
006 ROUND TOP EVANS
007 STROVE RANCH
008 NEIL-TARBELL
009 N. SAMS VALLEY
010 WEST PERRY ROAD
011 EAST PERRY ROAD
012 UPPER TABLE ROCK
013 CLEAR CREEK
014 OBENCHAIN
015 LICK CREEK
016 BROWNSBORO PARK
017 KANUTCHEN FIELD
018 NICHOLS GAP
019 SUGAR LOAF
020 EAGLE PT. CANAL
021 SECTION 9
022 SECTION 7
023 BULL RUN
024 BIG BUTTE
025 SHADY BRANCH
026 TOUVELLE
027 REESE CREEK
029 DERBY RD. SAWMILL
030 DERBY STATION
031 SUMMIT PRAIRIE
032 PATCO RANCH
033 LICK CREEK 80
034 WEST DERBY
035 VESTAL BUTTE
038 CROWFOOT
039 CROWFOOT CREEK
040 COBLEIGH RD. 80
041 MOSER MOUNTAIN
043 DEVON SOUTH
044 SALT CREEK 2
045 SALT CREEK 3
046 SALT CREEK 1
101 CHASE MOUNTAIN
102 EDGE CREEK
103 BUCK MOUNTAIN
104 BUCK LAKE
105 JOHNSON PRAIRIE
106 DEADWOOD
107 DIXIE
108 JENNY CREEK
109 AGATE
110 SODA MOUNTAIN
111 EMIGRANT CREEK
112 COVE CREEK
113 POOLE HILL
114 BUCK POINT
115 KEANE CREEK
116 HOWARD PRAIRIE
117 CONDE CREEK
118 SISKIYOU
119 GRIZZLY
120 BALDY
121 CASCADE RANCH
122 LAKE CR. SUMMER
123 LOST CREEK
124 DEER CREEK
125 SOUTH HEPPSIE
126 HEPPSIE MTN.
127 CARTWRIGHT
129 HUNGERFLAT
132 ANTELOPE ROAD
133 BROWNSBORO
134 YANKEE RESERVOIR
136 CANAL
137 BOX R RANCH
139 I-5
140 DRY LAKE
141 CHICKEN HILLS
142 LONG LAKE
143 COVE RANCH
144 BYBEE PEAK
145 BOX D RANCH
147 GRUBB SPRINGS
148 NORTH COVE CREEK
202 TUNNEL RIDGE
203 BILLY & SUGARLOAF MTN.
204 TIMBER MTN.
206 LOWER BIG APPLEGATE
207 STERLING CREEK
208 SPENCER GULCH
209 QUARTZ GULCH
210 STIEHL
211 FIELDER CREEK
213 CHAPMAN CREEK
216 DEL RIO
207 ECKER
218 STAGE ROAD
217 FOOTS CREEK
221 ROCK GULCH
222 LOMAS ROAD
223 STAR
302 PICKETT MTN.
303 JUMP OFF JOE
308 DEER CREEK
309 REAVES CREEK
310 O BAR X
312 EASTERLY LAKE
315 GLADE CREEK
316 CHERRY GULCH

FIGURE 1-1

LAND STATUS AND ALLOTMENTS



implemented. Existing livestock exclusions on 100 acres would be maintained. Table 1-1 summarizes acres under each existing grazing system. Grazing systems by allotment are listed in Appendix C, Table C-1. Wild horses would be managed under the existing Wild Horse Herd Management Plan.

Over the long term, forage production would be expected to decline under Alternative 1. As a result, the long term allocation to livestock and wildlife would be expected to be 3 percent lower and 2 percent lower, respectively, than at present.

Alternative 2 - Emphasize Livestock Grazing

The objective of Alternative 2 is to allocate a high level of forage to livestock while maintaining or improving range and forage conditions.

Forage would be allocated in the short term (during the 10-year implementation period) to livestock (41,140 AUMs), wildlife (56,248 AUMs), wild horses (250 AUMs), and nonconsumptive uses (56,615 AUMs). The short term livestock allocation under this alternative represents an 80 percent increase over 1982 active use levels. The allocations under this alternative would provide sufficient forage for big game populations (deer and elk), and would allow a total maxiumum wild horse population of approximately 50 horses.

Grazing systems would be designed to maximize livestock benefits (see Table 1-1). Livestock grazing would be allowed throughout 109 allotments within the EIS area, except where currently excluded (100 acres) and within new exclusions (approximately 25 acres) surrounding 4.75 miles of streams that have potential for significant improvement.

Proposed range improvements include seedings, hardwood removal, brush control, fences, corrals, and water developments and are summarized in Table 1-1. Proposed range improvements are listed by allotment in Appendix D, Table D-1. This alternative requires a total investment that is approximately double the range improvement funding level, as shown under the preferred alternative.

As a result of the range improvements, forage production is expected to increase by 23,005 AUMs. For analysis purposes, it is assumed that the predicted long term increase in forage production would be allocated to livestock (19,173 AUMs) and wildlife (3,832 AUMs).

Alternative 3 Preferred Alternative

The objective of Alternative 3 is to implement intensive grazing management to improve and maintain range and forage conditions to benefit wildlife, wild horses, nonconsumptive uses, and livestock.

Forage would be allocated in the short term (during the 10-year implementation period) to livestock (30,272 AUMs), wildlife (59,214 AUMs), and wild horses (250 AUMs). Nonconsumptive uses would have 56,615 AUMs allocated. The short term livestock allocation under this alternative represents a 32 percent increase over 1982 active preference levels. For analysis purposes, it is assumed that the predicted long term increase in forage production (14,964 AUMs) would be allocated to livestock (8,239 AUMs) and wildlife (6,725 AUMs) while the long term allocation to wild horses and nonconsumptive uses would remain unchanged. Allocations would provide sufficient forage to provide a potential increase of 10% in big game (deer and elk) populations.

Grazing systems would be designed to maintain or improve range and forage conditions and to improve 108 miles of streamside riparian habitat. No livestock grazing would be permitted within existing exclosures (100 acres) or on new exclusions (approximately 25 acres) surrounding 4.75 miles of streams that have potential for significant improvement (see Appendix G, Table G-1).

Proposed range improvements include seedings, hardwood removal, brush control, fences, corrals, and water developments. Only improvements which are cost efficient would be implemented under the preferred alternative. Further, this alternative was designed assuming a 10-year funding ceiling of approximately $1,000,000.00. Appendix D, Table D-1, presents the number and type of range improvement by allotment.

Alternative 4 - Emphasize Non-Livestock Values

The objective of this alternative is to emphasize non-livestock values where conflicts with livestock grazing have been identified.

Forage would be allocated in the short term to livestock (15,646 AUMs), wildlife (71,635 AUMs), and wild horses (250 AUMs). Nonconsumptive uses would have 57,802 AUMs allocated. The short term livestock allocation under this alternative represents a 31 percent decrease over 1982 active preference levels. For analysis purposes, it is assumed that the predicted long term increase in forage production (19,555 AUMs) would be allocated to wildlife (18,368 AUMs) and nonconsumptive uses (1,187 AUMs). Allocations for wildlife would allow a potential 30 percent increase in big game populations. The allocation to wild horses would be sufficient to maintain a maximum population of 50 horses. The long term allocation to livestock would decrease by 6,789 AUMs.

No livestock grazing would be authorized in existing exclusions (100 acres) the majority of which entails exclusion from whole existing pastures. This alternative would exclude livestock from 73,227 additional acres to enhance timber and recreation values, protect streamside riparian areas and semi-wet meadows which have significant potential for improvement and to protect two potential ACECs (Eight Dollar Mountain and Table Rocks). See Appendix C, Table C-1, for proposed grazing systems by pasture.

Proposed range improvements (intended for the primary benefit of non-livestock values) include riparian area protective fences, corrals, seeding, brush control and hardwood removal, and water developments. No herbicides would be used for livestock grazing management under Alternative 4, but some would be used to improve meadows for benefit of wildlife. This alternative includes some range improvements that may not be cost efficient and require a total investment that would be higher than the preferred alternative.

Comparison of Impacts

A summary of the comparison of long term impacts is displayed in Table 1-2. Detailed explanations of the impacts are given by resource in Chapter 3.

Components of the Alternatives

The proposed grazing management is composed of three interdependent elements: vegetation allocation, grazing systems, and range improvements. These elements are described in detail in Appendix B, Appendix C, and Appendix D.

The vegetation allocation proposed for each alternative would allocate the existing and future vegetation production to various uses including wildlife, wild horses, livestock, and nonconsumptive uses. By implementing grazing management and range improvements, the existing level of forage production would increase under Alternatives 2, 3, and 4. Appendix B describes the methodology used to determine the proposed allocations.

Appendix B, Table B-1 shows the short term and assumed long term vegetation allocation by alternative. Short term allocations indicate AUMs which would result due to implementation. Long term allocations are for analysis purpose only and are based on predicted AUM change during the 15-year period following implementation.

A grazing system consists of one or more scheduled livestock grazing treatments designed to change or maintain the composition of key species. Key species are plants that indicate whether management objectives are being reached. Grazing systems that allow plants to complete critical growth stages generally result in increases in, or maintenance of, key species. In the Medford EIS area, the critical part of the growing season normally occurs from April 15 to July 15, depending on elevation. See Table 1-3 for approximate growth stage dates for upland and riparian key species.

Appendix C, Table C-1, shows proposed grazing systems by allotment and pasture for each alternative. Grazing systems are defined in the glossary. Figure 1-2 shows typical examples of proposed systems.

Range improvements are proposed for several reasons: to implement intensive grazing systems, to allow deferment of grazing use on native range during the spring, to improve livestock distribution, to improve riparian areas, to increase forage production and to coordinate grazing and timber management. Brush would be removed prior to seeding on areas proposed for vegetation manipulation. Brush control would employ either mechanical methods, burning, or herbicide spraying; however, the treatment method has not been determined for individual projects.

Standard procedures and design elements for range improvements are described in Appendix D. These design elements have been standardized over time to mitigate adverse effects encountered during range improvement development. Range improvement proposals for Alternatives 2, 3 and 4, are listed for each allotment in Appendix D, Table D-1. The results of a preliminary benefit cost analysis for Alternative 3 are also shown.

Table 1-2 Summary Comparison of Long-Term Impacts of the Alternatives

Significant Resource	Existing Situation	Alt.1 No Action	Alt.2 Emphasize Livestock	Alt.3 Preferred Alternative	Alt.4 Emphasize Non-livestock
Water					
Runoff		NC	NC	NC	NC
Fecal coliforms		NC	NC	+L	+L
Sediment yield		NC	NC	+L	+L
Vegetation					
Ecological Condition (68,041 Acres)					
Late	2%	2%	5%	8%	5%
Middle	28%	28%	59%	43%	45%
Early	70%	70%	36%	49%	50%
Forage Condition Coniferous Forest (329,014 Acres)					
Good	1%	1%	2%	2%	1%
Fair	9%	13%	20%	16%	22%
Poor	42%	38%	32%	34%	29%
Unknown	48%	48%	48%	48%	48%
Range Trend (68,041 Acres)					
Up	14%	14%	66%	68%	67%
Static	70%	70%	23%	20%	22%
Down	8%	8%	1%	1%	1%
Unknown	8%	8%	8%	8%	8%
Long Term Forage Production (AUMs)	132,543	131,998	155,548	147,507	145,309
Streamside Riparian Vegetation Trend (104.25 Miles Total) [1]					
Increasing	24%	24%	30%	58%	78%
Static	62%	62%	64%	37%	22%
Decreasing	14%	14%	6%	5%	0%
Wildlife Populations					
Deer		-L	-L	+L	+M
Elk		-L	-M	+L	+M
Small mammals		-L	NC	NC	+M
Cavity dependent species		NC	-M	-L	-L
Upland game birds		NC	-L	+L	+M
Other birds		-L	NC	+L	+M
Reptiles		-L	NC	NC	+M
Amphibians		-L	NC	+L	+M
Fish		-L	NC	+L	+L
Soils					
Streambank Erosion (104 Stream Miles)					
Decreasing		24%	30%	58%	78%
Static		62%	64%	37%	22%
Increasing		14%	6%	5%	0%
Wild Horses (Numbers)	35	50	50	50	50
Recreation					
Long term visitor use		-L	-L	+L	+L
Visual Resources (Contrast)		NC	-L	-L	-L
Special Areas		NC	NC	NC	+L
Socioeconomics [2]					
Local personal income($000)	344	+97	+488	+266	-30
Local employment (jobs)	10	+3	+14	+8	-1
Leasees with loss over 10 percent of requirements (number)	105	0	0	0	2

Note: NC = no change, + = beneficial, - = adverse, L = low, M = medium, H = high

[1] Species composition based on key woody and herbaceous species.
[2] Socioeconomic impacts are shown as changes from the existing situation in Jackson and Klamath Counties.

Table 1-3 Approximate Growth Stage Dates for Key Species [1]

Species [2]	2500' Elevation				5000' Elevation			
	Start of Growth	Peak of Flowering	Seed Ripe	Dormancy	Start of Growth	Peak of Flowering	Seed Ripe	Dormancy
Idaho fescue	3/1	6/1	7/1	8/1	4/15	6/20	7/20	8/20
California oatgrass	3/15	6/15	7/15	8/15	5/1	7/1	8/1	9/1
Pine bluegrass	3/25	5/25	6/25	7/25	4/15	6/1	7/1	8/1
Wedgeleaf ceanothus [3]	4/1	4/20	6/10	7/15	N/A	N/A	N/A	N/A
Mountain brome	4/1	5/25	6/25	7/25	4/15	7/1	8/1	9/1
Redstem ceanothus	4/15	6/15	7/15	8/15	5/1	7/1	8/1	9/1
Deer brush	4/15	6/15	7/15	8/15	N/A	N/A	N/A	N/A
Bluebunch wheatgrass	3/1	6/1	7/1	8/1	N/A	N/A	N/A	N/A

[1] Average year at the 2500 and 5000 foot elevations.
[2] Scientific names for plants listed are shown in Appendix F.
[3] Key species on deer winter range.

N/A - Plant does not occur in significant numbers at this elevation.

Interrelationships

BLM Planning

The BLM planning system is essentially a decisionmaking process that uses public input and resource information.

Land use objectives and rationale for each resource use category relating to the grazing management program were developed and incorporated into a proposed amendment to the Josephine and Jackson-Klamath Management Framework Plans (MFP). Specific MFP recommendations relating to the grazing program, with some modification to reflect public input, were used as a basis for developing the alternatives. The EIS scoping summary set forth in Appendix A more fully explains the relationship between the MFP alternatives and the EIS alternatives.

After the decision, the existing Allotment Management Plans (AMPs) will be revised to correspond with the allocations and grazing management described in the Record of Decision.

Federal Agencies

The Medford Grazing EIS Area shares, in part, common boundaries with lands administered by the U.S. Forest Service. Coordination between the BLM District Manager and Forest Supervisors is routine. Specific project and program coordination takes place as needed at all management levels. Lands under the jurisdiction of other Federal agencies are occasionally administered for grazing by the BLM.

In addition, the Soil Conservation Service initiates development of coordinated resource management plans (CRMPs) when requested by ranchers who utilize land managed by more than one government agency. Coordinated planning involving the ranchers and concerned Federal agencies ensures that conflicts are resolved and management goals are met.

State and Local Governments

The Intergovernmental Relations Division for the State of Oregon acts as a clearinghouse for the various State agencies. All BLM planning and major actions are coordinated through this State Clearinghouse. Planning is also coordinated with county commissioners and/or county planning commissions.

Under Oregon Senate Bill 100, all counties and cities in Oregon are required to develop and adopt comprehensive plans and land use controls consistent with statewide planning goals and guidelines developed by the Land Conservation and Development Commission (LCDC). The Douglas County and Jackson County Comprehensive Land Use Plans have been accepted by LCDC. Plans for Coos, Curry, Josephine, and Klamath counties have

not yet been acknowledged (accepted) by LCDC. The relationship of the alternatives to LCDC goals is displayed in Table 1-4. All the alternatives are consistent with the adopted comprehensive plans and LCDC goals.

Private Landowners

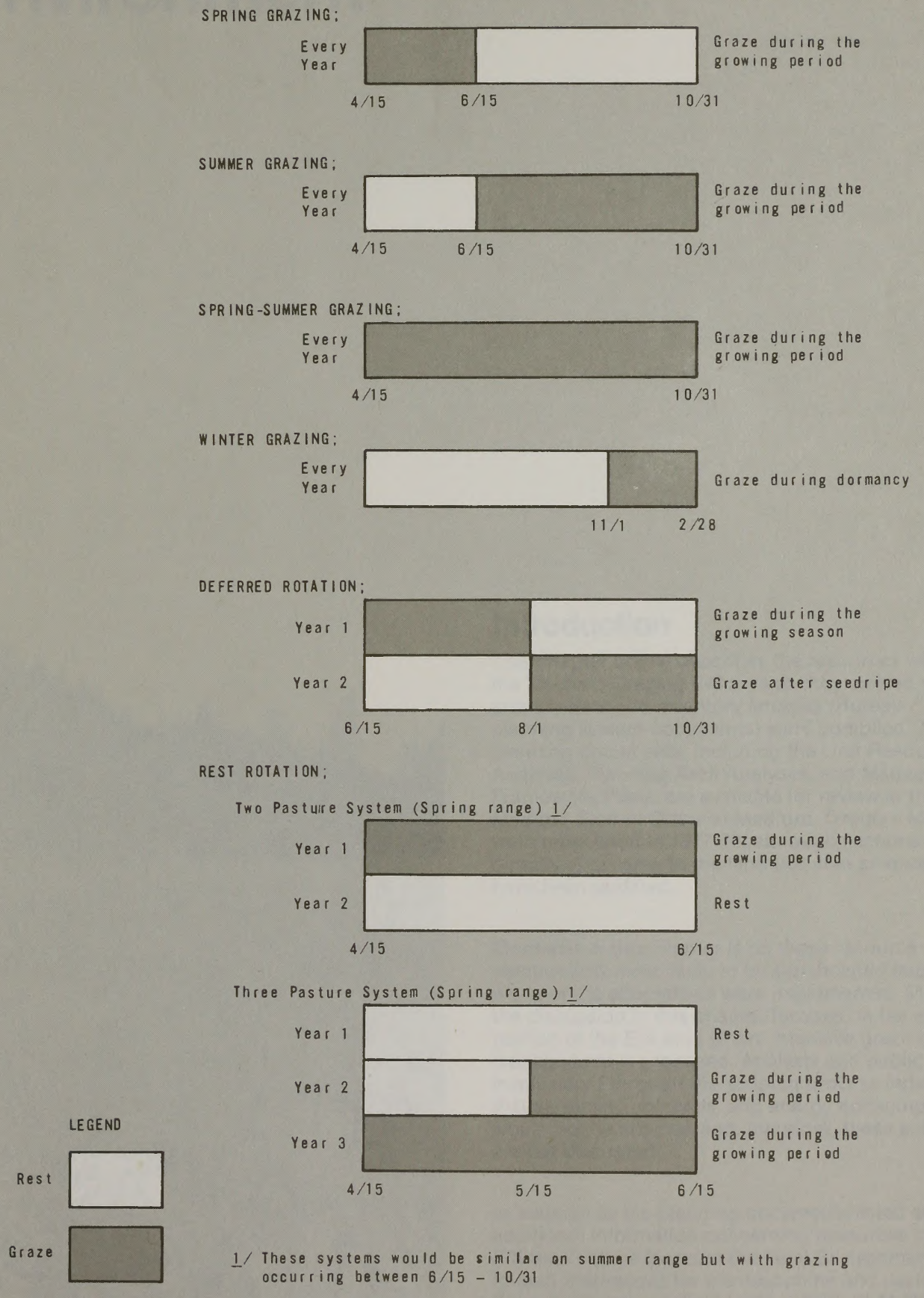
The large amount of intermingled private lands within the Medford EIS area necessitates coordinated planning which provides a high level of cooperation between the BLM and adjacent landowners. Following the EIS and decisionmaking, allotment management plans (AMPs) or coordinated resource management plans (CRMPs) would be prepared in consultation and coordination with the affected rancher, other interested parties, and other landowners in accordance with BLM policy and Federal grazing regulations (43 CFR 4100). Generally, the preferred arrangement for including private and state lands in AMPs or CRMPs is under an exchange-of-use agreement (43 CFR 4130.4-1). At present, about 14,600 AUMs are allotted on approximately 300,000 acres through adjacent private exchange-for-use agreements. These agreements benefit the District's grazing management program by consolidating grazed areas, establishing BLM administration of them and implementing management for the allotments in which the grazing use is made.

Table 1-4 Relationship of the Alternatives to LCDC Goals [1]

LCDC Statewide Goal Number and Description	Discussion
1. To ensure citizen involvement in all phases of the planning process.	BLM's land-use planning is a process providing for public input at various stages. Public input was specifically requested in developing the preferred alternative and other alternatives described in the EIS. Public input will continue to be utilized in the environmental decision processes.
2. To establish a land-use process and policy framework as a basis for all decisions and actions.	The alternatives have been developed in accordance with the land-use planning process authorized by the Federal Land Policy and Management Act of 1976 which provides a policy framework for all decisions and actions.
4. To conserve forest lands for forest uses.	All alternatives provide for retention of inventoried forest lands for forest uses. In forested areas, an objective of all alternatives is coordination of grazing management with timber management objectives.
5. To conserve open space and protect natural and scenic resources.	The Bureau planning system considered natural and scenic resources in the development of the alternatives. Fencing and vegetation manipulation projects in Alternatives 2, 3, and 4 would slightly impact natural and scenic resources.
6. To maintain and improve the quality of the air, water and land resources.	Water quality would be maintained and/or improved under Alternatives 3 and 4 and would be maintained and/or degraded under Alternatives 1 and 2. Air quality would not be significantly impacted.
8. To satisfy the recreational needs of the citizens of the State and visitors.	The BLM actively coordinates its outdoor recreation and land-use planning efforts with those of other agencies to establish integrated management objectives on a regional basis. Under all the alternatives, opportunities would be provided to meet recreational needs.
9. To diversify and improve the economy of the State.	Alternatives 1, 2 and 3 would induce economic gains in the long term due to increased forage production, resulting in improved local and State economies.

[1] Goals 3, 7, 10, 11, 12, 13 and 14 developed by the LCDC are not generally applicable to the alternatives.

FIGURE 1-2 EXAMPLES OF TYPICAL GRAZING SYSTEMS



1/ These systems would be similar on summer range but with grazing occurring between 6/15 – 10/31

Chapter 2 Affected Environment

Introduction

This chapter briefly describes the resources within the Medford Grazing EIS area as they existed when primary data and inventory sources (Bureau planning system documents) were compiled. These planning documents, including the Unit Resource Analyses, Planning Area Analyses, and Management Framework Plans, are available for review in the Medford District Office in Medford, Oregon. Most were completed in 1977-78, although sections directly applicable to the land use plan amendments have been updated.

Emphasis in this chapter is on those resource components most likely to be significantly impacted if one of the alternatives were implemented. Much of the discussion in this chapter focuses on the eastern portion of the EIS area where intensive grazing management is proposed. Analysis and public involvement through the scoping process indicated that air quality, minerals, and energy consumption would not be affected and, therefore, these subjects are not discussed.

In addition to the planning documents listed above, additional information concerning resources in the EIS area can be found in the Final Environmental Impact Statements for the Josephine and Jackson-Klamath Sustained Yield Units (USDI, BLM 1978a

and 1979a, respectively). Reading copies of these EISs are available at BLM offices in Portland and Medford, Oregon, and Washington, DC. Copies were also sent to 4 university and 10 public libraries in western Oregon.

The Medford Grazing EIS area, located in southwestern Oregon, has a climate characterized by cool, wet winters and hot, dry summers. The area has a winter precipitation pattern, with about half of the annual total occuring during the months of November through February.

Vegetation

The grazed portion of EIS area has 12 major vegetative zones (potential ecological communities) and 17 different forest and range sites within these zones (See Table 2-1 and Figure 2-1). The coniferous forest sites are the dominant vegetation types, covering approximately 70 percent of the area. The remaining 30 percent of the area is oak-woodland and grassland vegetation (See Table 2-1).

Existing forage production for the EIS area is 132,543 AUMs. Livestock forage production is that portion of the total vegetation production which is available and suitable for sustained use by livestock. Livestock forage production is dependent upon climate, soil characteristics and species composition. Yearly variation in timing, temperature and amount of precipitation may result in fluctuation of vegetation production. Soil characteristics which influence production are primarily those which influence water holding capacity. Species composition of the plant community is the third major factor affecting forage production, season of use, and duration of grazing.

Vegetative condition for the EIS area is summarized in Table 2-2. Condition is expressed by two methods (ecological condition or forage condition). Ecological condition was determined for non-forest sites, and livestock forage condition was used in the coniferous forest sites. Ecological condition classification, as used in this document, is based on the degree a range site deviates from the potential for the site. Forage condition classification is based on the percentage of desirable and intermediate forage species available for livestock and/or big game on a forest site. Both methods for determining condition are described in Appendix E. Appendix C, Table C-1, shows the condition for each proposed pasture in the EIS area.

An intensive inventory was completed for the riparian areas in the eastern portion of the EIS area. A document (Culbertson and Montgomery 1982) is on file in the Medford District Office which contains specific information for any given stream or portion thereof. Table 2-4 shows the percentage of the surveyed riparian areas in the different condition classes. The effects of road development, timber harvesting, and grazing produced the described condition of the riparian area.

The vegetative communities of the riparian ecosystems are described in terms of the dominant vegetation present in or overhanging the riparian zone. Thirty-six communities are identified. Within each community type described, there may be a wide range of foliar cover and density of vegetation. Riparian ecosystems are very diverse and each mile of stream can be different due to many influencing factors. These influences may include: hydrologic characteristics such as frequency of flooding, water volume, and flow rate and duration; aspect; slope; sub-surface flows; topography; geomorphology; soil accumulation; present vegetation; and past management.

The condition of the riparian communities has been described in the Wildlife Section of this chapter (See Table 2-4). Areas in fair and poor condition generally are dominated by even-aged red alder or willow because these communities lack structure and species diversity.

None of the plants found in the grazed portion of the EIS area are presently listed as threatened or endangered under the authority of the Endangered Species Act. However, there are 18 plant species (on 14 allotments) identified in the EIS area that are under review by the U. S. Fish and Wildlife Service for possible listing as endangered or threatened status (45 FR 82480) (See Table 2-3).

In addition, 40 plant species considered by BLM as sensitive occur in the EIS area. A complete listing of these sensitive plant species along with habitat information is on file at the Medford District Office.

Soils

Soils in the EIS area have been surveyed and are described in de Moulin et al. (1975). The soils on the east side of the area have been mapped in more detail by the Soil Conservation Service, U.S.D.A. since the soil inventory was published. The detailed soil mapping was used to produce updated soil association overlay maps of the east side. The overlay maps and accompanying soil interpretations can be reviewed at the Medford District Office.

Table 2-1, Vegetation Zones And Sites

Vegetation Zone and Sites	Public Land Acres	Percent of EIS Area	Common Plant Species
1) Dry Upland Zone	113,387	28.5	
A. Steep foothill grassland			Annual grasses, bluebunch wheatgrass, Idaho fescue
B. Shrubby scabland			Wedgeleaf ceanothus, annual grasses, bluebunch wheat grass, needlegrass
C. Oak-pine-oatgrass			White oak, ponderosa pine, California oatgrass, Idaho fescue, annual grasses
D. Oak-pine-fescue			White oak, ponderosa pine, Idaho fescue, annual grasses
E. Dry meadow			California oatgrass, buttercut, Junegrass, annual grasses and forbs
F. Semi-wet meadow			California oatgrass, tufted hairgrass, bluegrass, cinquefoil
G. Mahogany-oak-fescue			Birchleaf mahogany, white oak, Idaho fescue
H. Douglas-fir forest			Douglas-fir, pine, California fescue, poison oak
I. Douglas Fir/mixed pine			Douglas-fir, sugar pine, ponderosa pine, deerbrush, blue wild rye
J. Pine-oak-fescue			Ponderosa pine-whiteoak-Idaho fescue
2) Shale City Zone	14,733	3.7	
A. Mixed fir-Ocean-spray forest			White fir, Douglas-fir, ponderosa pine, sugar pine, blue wild rye
B. Semi-wet meadows			See 1f above
C. Steep Mountain grassland			Idaho fescue, Junegrass, needlegrass, rabbitbrush, birchleaf mahogany, annual grasses

Table 2-1, Vegetation Zones And Sites (continued)

Vegetation Zone and Sites	Public Land Acres	Percent of EIS Area	Common Plant Species
3) Parker Mtn-Fish Lake Zone	15,769	4	
A. White fir forest			White fir, Douglas-fir, ponderosa pine, sugar pine, sedge, blue wild rye, mountain brome, strawberry, Oregon grape, prince's pine
B. Semi-wet meadow			Tufted hairgrass, sedge, clover, bluegrass, velvetgrass,willow weed, spirea, hellebore
4) Soda Mtn-Table Mtn. High Country Zone	13,409	3.4	
A. White fir forest			White fir, Douglas-fir, ponderosa pine, sugar pine, incense cedar, waterleaf, vetch, Solomon plume, pathfinder
B. Semi-wet meadow			See 1f above
C. High mountain grassland			Idaho fescue, stipa
5) Shasta Fir Zone	13,617	3.4	
A. Shasta fir forest			Shasta fir, white fir, sugar pine, ponderosa pine, white pine, Ross sedge, Pacific brome, boxwood, snowbrush
6) Klamath White Fir Zone	23,174	5.8	
A. Klamath white fir forest			White fir, Douglas-fir, ponderosa pine, snowbrush
B. Semi-wet meadow			See 1f, 3b above
7) Butte Falls Dogwood Zone	22,069	5.6	
A. Mixed fir forest			White fir, Douglas-fir, pines, cedar, madrone, black oak, deerbrush, reostem, hazel, Oceanspray, ninebark, blue wild rye, bluegrass, cheatgrass
B. Semi-wet meadow			See 1f, 3b above

Table 2-1, Vegetation Zones And Sites (continued)

Vegetation Zone and Sites	Public Land Acres	Percent of EIS Area	Common Plant Species
8) Prospect White Fir Hemlock Zone	7,920	2.0	
A. White fir			White fir, Douglas-fir, sugar pine, ponderosa pine, incense cedar, western hemlock, redstem, snowbrush, mountain brome, blue wild rye
B. Semi-wet meadow			See 1f, 3b above
9) Applegate Dry Upland Zone [1]	99,750	25.1	
A. Mixed forest forest			White fir, Douglas-fir, pines
B. Oak-pine-fescue			White oak, ponderosa pine, Idaho fescue, annual grasses
C. Grassland			Idaho fescue, annual grasses
10) Rogue-Umpqua Zone [1]	71,076	17.9	
A. Mixed fir forest			White fir, Douglas-fir, ponderosa pine, sugar pine, deerbrush, sedge, beargrass, blue rye
B. White fir			Whitefir, Douglas-fir, ponderosa pine, sugar pine, cedar, prince's pine, beargrass, mountain brome, oceanspray, Oregon grape
C. Semi-wet meadows			See 1f, 3b above
11) Interior Valley Zone [2]	1,401	.4	White oak, wedgeleaf ceanothus, Idaho fescue, oatgrass, annual grasses
12) High Siskiyou Zone [2]	750	.2	White fir, Douglas-fir, ponderosa pine, sugar pine, blue wild rye, greyleaf manzanita
Total	397,055		

[1] These zones were not inventoried due to the low livestock grazing demand on BLM-administered land and inventory funding level.
[2] This zone was not inventoried due to the minor amount of BLM-administered land.

Table 2-2 Condition Summary

Ecological Condition	Acres of [1] Public Land Non-forested and Hardwoods	Percent Comparison of Non-Forested Areas	Percent of [2] Public Land EIS Area
Late	1,376	2	1
Middle	19,052	28	5
Early	47,613	70	12
Total	68,041		

Forage Condition	Acres Public Land Forested	Percent Comparison of Forested Land	Percent of Public Land EIS Area
Good	329	1	1
Fair	28,725	17	7
Poor	138,462	82	34
Total	167,516		
Unknown [2]	161,498		

[1] Includes oak woodlands and is based on deviation from ecological potential.
[2] Condition of 161,498 acres (about 40 percent of the grazed public land in the EIS area) has not been inventoried.

Table 2-3 Plant Species Under Review For Nomination For Threatened Or Endangered Status [1]

Scientific Plant Species Name	Notice of Review Category [2]	Habitat Information	Allotments [3]
Arabis aculeolata	2	Serpentine	309; 312
Calochortus greenei	1	Dry, grassy hillsides in clay soil	110; 118; 108
Calochortus howellii	1	Serpentine	308; 312
Cirsium ciliolatum	1	Dry, grassy hillside	107; 110
Cypripedium californicum	2	Bogs and wet area	6; 308
Cypripedium montanum	2	Timbered areas	110; 117;121; 205; 206
Darlingtonia californica	2	Bogs and wet areas	308
Gentiana bisetaea	1	Bogs and wet areas	308
Lewisia cotyledon var. Howellii	1	Rock outcrops	31
Lewisia oppositifolia	1	Serpentine	309; 312
Lilium vollmeri	1	Bogs and wet areas	308
Limnanthes floccosa ssp. bellingeriana	1	Scab land	110; 115; 31
Microseris detlingii sp. novumined.	2	Dry, grassy hillsides in clay soil	110; 118
Mimulus pygmaeus	2	Damp sites in open woods	115
Phacelia capitata	1	Serpentine	6
Schoenolirion bracteosum	1	Bogs and wet areas	308
Thlaspi montanum var. siskiyouense	2	Serpentine on rocky slopes	308
Viola lanceolata ssp. occidentalis	2	Bogs and wet areas	308

[1] As published in "Endangered and Threatened Wildlife and Plants: Review of Plant Taxa for listing as Endangered or Threatened Species" Federal Register Vol. 45, No. 24 12/15/80.
[2] Category 1 = Sufficient biological justification exists for listing as endangered or threatened status; Category 2 = Further study is needed to determine if biological justification for listing exists. Categories are subject to change as new information becomes available.
[3] Allotments are listed in which the subject plant has been sighted on public land.

U. S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
MEDFORD DISTRICT

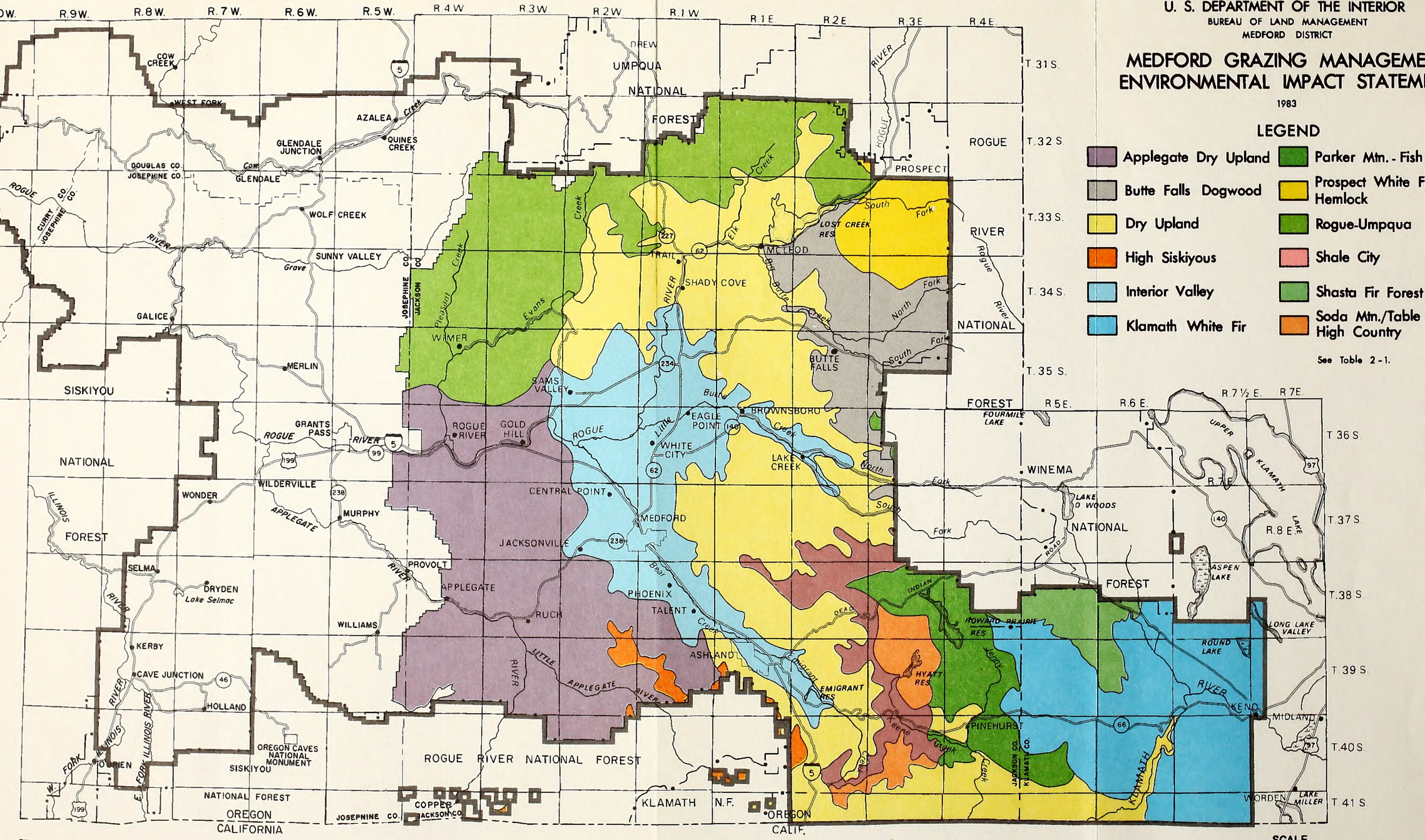
MEDFORD GRAZING MANAGEMENT ENVIRONMENTAL IMPACT STATEMENT

1983

LEGEND

- Applegate Dry Upland
- Butte Falls Dogwood
- Dry Upland
- High Siskiyous
- Interior Valley
- Klamath White Fir
- Parker Mtn. - Fish Lake
- Prospect White Fir-Hemlock
- Rogue-Umpqua
- Shale City
- Shasta Fir Forest
- Soda Mtn./Table Mtn.-High Country

See Table 2-1.



Footnote: Vegetation zones for the Western portion of the EIS area are shown in Figure 2—7 of the Final Timber Management EIS for the Josephine Sustained Yield Unit (USDI, BLM 1978)

FIGURE 2-1
VEGETATION ZONES

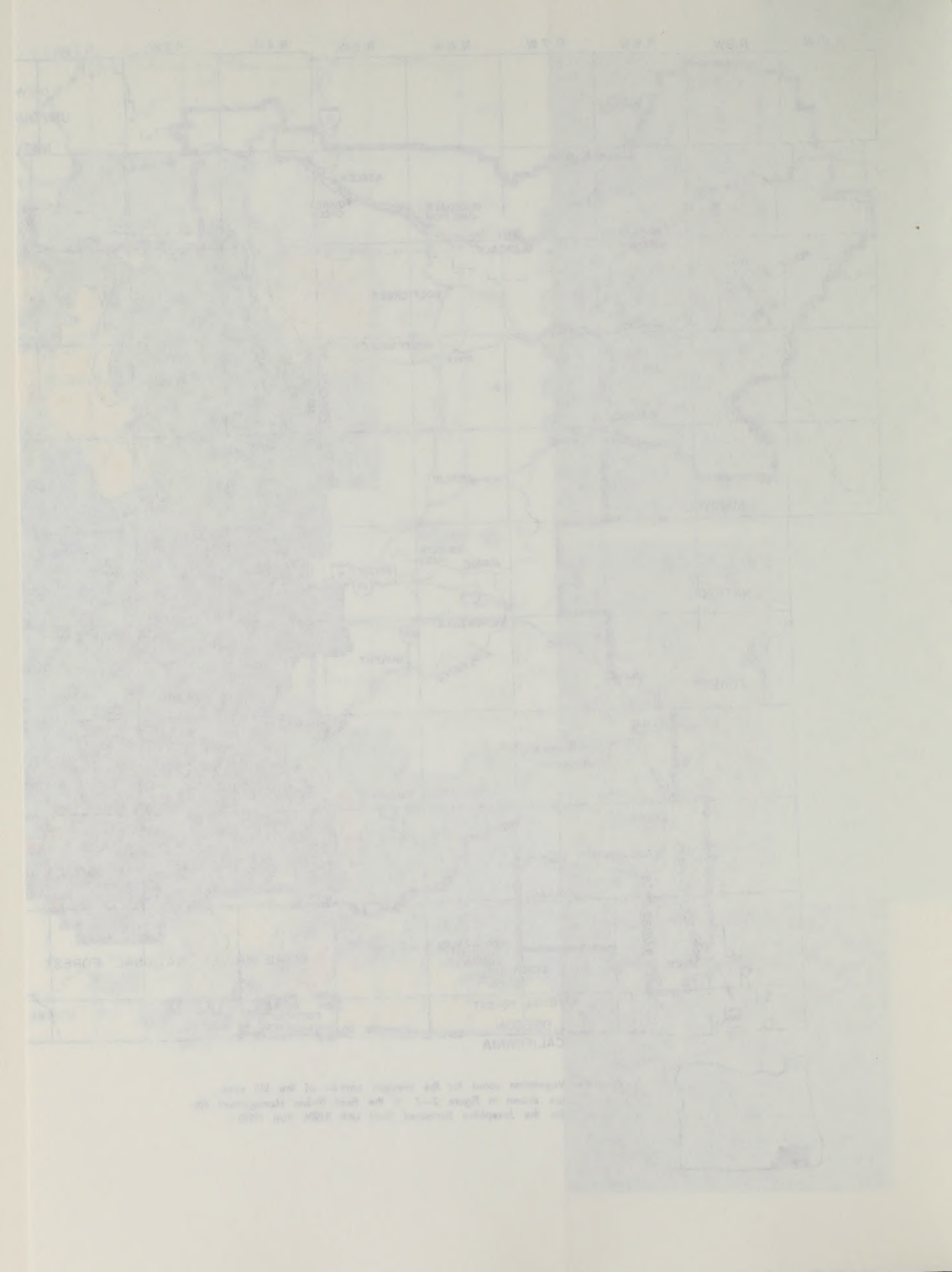


Table 2-4 Known Existing Conditions of Wildlife Habitat In Riparian Areas

Condition [1]	Class 1 and 2 Streams [2]	Class 3-5 Streams [3]	Total
Excellent	13 Miles (2%)	68 Miles (10%)	81 Miles (12%)
Good	62 Miles (9%)	291 Miles (44%)	353 Miles (53%)
Fair	26 Miles (4%)	154 Miles (23%)	180 Miles (27%)
Poor	4 Miles (Less than 1%)	47 Miles (7 %)	51 Miles (8%)
		Total	665 Miles (100%)

[1] Riparian inventory methodology is shown in Appendix G.
[2] Based upon 100 percent survey of Class 1 and 2 streams in the Butte Falls and Klamath portion of the EIS area.
[3] Based upon a random sampling of Class 3-5 streams in the Butte Falls and Klamath portion of the EIS area.

The soils have formed from several major rock units in the Siskiyou Mountains and Cascade Range. The soils in the Cascade Range in the southeastern portion of the EIS area have weathered to loamy and light clayey textured soils that occupy plateaus and gently sloping high terraces. The western flank of the Cascade Range is dominated by moderately deep and deep soils with heavy clayey textures and gravelly, loamy soils. Land forms range from nearly level terraces to very steep mountain slopes.

The soils in the Siskiyou Mountains in the western portion of the EIS area have formed from altered bedrock. The soils have sandy to clayey textures and occur on moderately steep to very steep mountain slopes.

Erosion caused by livestock and wildlife in upland areas (areas other than along streams) is generally low. Streambank erosion is occurring on isolated portions of approximately 19 percent of the 216 miles of streambank inventoried in the eastern portion of the EIS area.

Water Resources

The southeastern portion of the EIS area lies within the Klamath Basin, the northwestern portion of the EIS area lies within the Umpqua Basin, and the remainder of the EIS area lies within the Rogue Basin.

Streamflows in the EIS area are extremely variable. Highest stream flows occur during winter and spring months from rainstorms augmented by snow melt. Low flows occur in the late summer and fall.

Present non-point source pollution problems in the EIS area include those of elevated water temperatures, nuisance algae and aquatic plant growth, excessive debris, sedimentation, streambank erosion, and water withdrawals causing stream-quality problems (ODEQ 1978). Streams in the EIS area considered to have major non-point source pollution problems include South Fork Little Butte Creek, Evans Creek, Bear Creek, the Applegate River, and Deer Creek.

BLM water quality inventories were conducted during 1981 and 1982 on eight streams in the grazed portion of the EIS area. The water quality of these streams generally met the water quality standards established by the Oregon Department of Environmental Quality. Fecal coliforms and turbidity were occasionally above state standards on Jackass Creek, North Fork of Big Butte Creek, and Dead Indian Creek.

Refer to the Josephine and Jackson-Klamath FEISs (USDI, BLM 1978a and 1979a) for additional information on water quantity and water quality within the EIS area.

Wildlife

This section deals primarily with the eastern portion of the EIS area where intensive livestock grazing is currently occurring. Animals emphasized are those whose habitat could be significantly changed by the alternatives. Mountain lion, black-bear, bobcat, and coyotes are not discussed because those populations are not expected to significantly change as a result of the alternatives.

A complete species list of the district with specific habitat relationships is available at the Medford District Office (Culbertson and Montgomery 1983). Also available at the Medford District Office are copies of the site specific habitat inventories and accompanying specific discussions of those habitats.

Habitat Diversity

Habitat diversity refers to the mixture or variety of land forms, vegetation, and water. Vegetation provides habitat diversity in three ways: (1) interspersion of vegetation types, i.e., edge effect, (2) variety of plant species, i.e., species composition, and (3) structure or the physical aspects of vegetation. Examples of structure are grazed versus ungrazed dry or wet meadow habitats. Grazing affects habitat diversity; however, within the Medford District, forestry practices such as timber harvesting, firewood sales, or stand conversions (i.e., oak-woodlands to pine savanna) have had and will continue to have the greatest effect on habitat diversity.

Habitat diversity can be correlated with the forage condition described in the vegetation section. Generally, vegetation communities in the EIS area with good forage condition would have greater habitat diversity than similar areas in poor or fair condition. Seedings are an exception since they have low habitat diversity, although they are usually rated in good forage condition. Wildlife habitat in riparian areas rated as good has greater habitat diversity than areas rated poor. In general, the greatest numbers and kinds of wildlife are found in areas with the greatest habitat diversity.

Threatened and Endangered Animals

The American peregrine falcon is classified as endangered and the bald eagle as threatened in Oregon under the Endangered Species Act, 1973. Although peregrines migrate through the EIS area, observations are rare and no active nests have been found. Bald eagles are known to nest in the EIS area, and one of the largest winter concentrations of bald eagles in the Pacific Northwest occurs in the extreme southeastern portion of the EIS area; however, the alternatives should not have any significant impacts on the winter eagle roost. The Jenny Creek sucker is under consideration for placement on the federal list of threatened and endangered speices because of its unique taxonomic status and limited distribution. The specie inhabits 24 miles of 5 streams in the Jenny Creek watershed (Table 2-5). Of the 8 miles of its habitat on public land, there are significant adverse impacts from livestock grazing to 3.4 stream miles in allotments 107, 108, 110, and 115. BLM manages 43 percent of the Jenny Creek watershed.

Riparian Areas

Due to its relative scarcity (less than 5 percent of the total land base), water-associated and riparian vegetation are very important to wildlife as habitat for feeding and reproducing. For impact analysis, these areas are described in three categories: Class 1 and 2 streams, Class 3-5 streams, and semi-wet meadow habitat. The designation of a stream as Class 1-5 is based primarily on fisheries values with Class 1 and 2 being most important. Class 1 streams are usually larger and have the potential for more extensive adjacent riparian areas. In this document, riparian areas are the linear strips of water-associated vegetation occurring along the streams.

A site specific listing of streamside riparian areas is shown in Appendix G, Table G-1.

Not all upland semi-wet meadow habitats were quantified in acres or mapped due to their small size. Meadow habitats less than 5 acres were not mapped. The following is a breakdown of condition class for the 1,580 acres of semi-wet meadow habitats that were examined: excellent (0 acres), good (4 percent - 63 acres), fair (12 percent - 190 acres), poor (84 percent - 1,327 acres). Habitat for wildlife is far below potential in most semi-wet meadow habitat primarily because of past heavy livestock use, and the subsequent invasion of annual weed species such as medusahead.

Fish

Thirty-three native and introduced fish species inhabit 550 miles of stream and three major reservoirs in the eastern portion of the EIS area. One hundred eight of the stream miles occur on public land. Thirty-four percent of the public stream miles provide spawning and rearing habitats for chinook and coho salmon and steelhead trout. Resident cutthroat or rainbow trout are found in all fish-bearing streams.

A stream habitat inventory by BLM during the summers of 1980-82 evaluated stream habitat condition for salmonids on 108 miles of Class 1 and 2 stream in the eastern portion of the EIS area, the area where most livestock grazing in the district occurs. Habitat condition and species occurrence for each stream is shown in Table 2-5. No stream miles are rated in excellent or poor condition. Forty-four percent are in good condition and 56 percent are in good to fair or fair condition.

Methodology for determining the condition rating for salmonid habitat is described in Appendix G. A single habitat quality rating was determined for both rainbow trout and the Jenny Creek sucker in Jenny Creek and its tributaries (Table 2-5), since habitat requirements for both species are quite similar. The primary exception is the sucker's need for slightly higher water temperature than is optimum for trout. Water temperatures in the Jenny Creek Drainage favor the Jenny Creek sucker.

Livestock currently adversely affect 20.4 miles of fishery habitat on 33 streams (Table 2-5) that are approximately 51 miles in length. Eighty-eight miles (81 percent) of the 108 Class 1 and 2 stream miles have insignificant on-site impacts from livestock grazing. Streams with negligible livestock grazing impacts are generally characterized by one or more of the following situations: (1) riparian vegetation or woody debris on the ground is dense and acts as a barrier to livestock, (2) stream banks are well constituted with rock or dense root systems, (3) the stream is located in steep, rocky terrain that discourages or prevents use by livestock, and (4) the canopy of streamside vegetation, including conifers,

Table 2-5 Summary Of Stream Fisheries Habitat Condition on Public Land [1]

Stream (Drainage)	Miles			Allotment	Stream Miles Affected By Grazing	Fish Species
	Good	Good/Fair	Fair			
Butte Falls Resource Area						
Beaverdam			1.20	31	—	CT, COT
Parsnip		1.20		31	0.25	CT, COT
Round Mountain	0.30			31	—	CT, COT
Vine Maple	0.25	1.20	0.15	31	—	CT, COT
S. Fk. Vine Maple	0.65				—	CT, COT
Big Butte (mainstem)	0.30	1.60		31	0.70	CHS, COS, ST, CT, RT, KSS, PL, COT
Box	0.60			31	—	ST, RT, CT, COT
Clark	2.70			31	—	ST, RT, CT, COT
Clark Cr. Tributary		.75		31	—	CT, COT
N. Fork Clark	0.70			31	—	CT, COT
S. Fork Clark		.50		31	—	CT, COT
Dog	1.35			31	—	ST, RT, CT, COT
McNeil			0.50	31	—	ST, CO, RT, CT, COT, KSS, BG
Big Butte (north fork)	2.50	3.70		24,31	0.35	ST, RT, CT, COT
Camp	0.25	1.90		24	—	ST, RT, CT, COT
Eighty Acre		0.50	0.25	31	0.25	ST, RT, CT, COT
Jackass	0.70	1.00		31	1.05	ST, RT, CT, COT
Mule	0.40	0.30		31	—	CT, COT
Horseshoe	0.25	0.50		31	0.35	CT, COT
Big Butte (south fork)		0.90		31	—	ST, RT, CT, COT, KO, LB
Clarks Fork		0.40		24	—	CT, COT
Rancheria	0.30	1.40		24	0.25	CT, COT
Titanic	1.30			24	—	CT, COT
Twincheria	0.60	1.00		24	—	CT, COT
S.Fork Twincheria			0.60	24	0.55	CT, COT
Brush			0.75	UNA	—	ST, CT
Elk	0.60	0.45	0.60	1	0.25	CHS, COS, ST, RT, CT, KSS, PL, RS, COT
Alco	0.25			2	—	ST, RT, CT, COT
Flat		0.95		2	—	ST, COS, RT, CT, COT
Sugarpine		1.25		2	—	ST, COS, RT, CT, COT
Hawk		1.00		2	—	ST, COS, RT, CT, COT
Timber		1.10		2	—	ST, COS, RT, CT, COT
Elkhorn	1.20			2	—	ST, COS, RT, CT, COT
West Branch Elk	1.35	1.00	0.50	2	0.45	ST, COS, RT, CT, COT
E. Fk. W. Br. Elk	0.90	0.20		2	0.25	CT, COT
Moraine	1.10			UNA	—	ST, RT, CT, COT
Hungry	0.25			UNA	—	CT
South Boundary	1.10			13	—	CT, COT
Indian	1.00	0.25		35	—	ST, COS, RT, CT, COT, MOS, BB
Lewis			0.80	UNA	—	ST
Lick	1.70	0.50	0.25	24	0.75	ST, RB, COT
Lost	0.30	0.30		31	—	CT, COT
Lost			0.50	1	0.50	RT, CT, COT
Reese	1.30			20,27,29	—	ST, RT, COS, COT, KSS
Salt	1.30	0.50		24	0.25	ST, RT, CT, COT
Salt Creek Tributary	0.80			24	—	CT, COT
East Fork Trail	0.50			3	—	ST, RT, CT, COT, PL, COS
Wall	1.90			3	—	CT, COT
Wasson	0.50			24	—	CT, COT

Table 2-5 Summary Of Stream Fisheries Habitat Condition on Public Land [1] (continued)

Stream (Drainage)	Miles Good	Miles Good/Fair	Miles Fair	Allotment	Stream Miles Affected By Grazing	Fish Species
Klamath Resource Area						
Antelope Cr.			1.00	UNA	0.20	ST
Camp		1.10	1.70	110	1.70	RT
Dutch Oven	0.40	0.80		110	0.25	RT
Emigrant	0.50	0.25		110	—	CT
Baldy	0.30	0.20		110	—	CT
Cove			0.35	143	0.35	ST, RT, CT
Green Mt.		0.30		110	—	CT
Porcupine	0.50	0.50		110	—	CT
Tyler	0.35	1.00		110	0.20	CT
Fall		0.30	0.60	107	0.35	RT
Shoat Spring Cr.		0.25	0.25	107	—	RT
Spring		0.25	0.45	107	0.60	RT
Spring Cr.Trib. #1		0.10		107	—	RT
Spring Cr. Trib. #2	0.25			107	—	RT
Jenny	2.05	2.55	1.40	107,108	1.90	RT, JCS, SD, BB, PK, GS, COT
				110,115	0.60	
Corral			0.60	110		RT, JCS, SD
Beaver	1.50	0.55	0.40	110,115	—	RT, JCS, SD
Grizzly	0.30	0.30	0.60	115,106	0.50	RT, SD, BB, PK, GS, COT
Willow		0.30		115	0.10	RT
Johnson	1.70	0.30	1.35	103,104	—	RT, JCS, SD
Cold	0.30			103	—	RT
Keene	2.20	1.10	0.25	110,115	2.00	RT, BT, SD, BB, JCS
Lincoln	0.50			110	0.40	RT
Mill		0.50		110	0.50	RT
South Fork Keene		0.30		110	—	RT
Soda	0.75			115	—	RT
Lake Cr.			1.10	121,129	—	CT
Little Butte Cr. (North Fork)	0.50			126	—	ST, RT, CT, BT, COT
Little Butte Cr. (South Fork)	0.80		0.25	113,127	—	ST, RT, CT, COT
Dead Indian			1.15	115,117	1.15	RT, SD
Conde	0.20	0.30	0.50	117	1.00	RT, SD
Deer	0.80			124	—	CT, COT
Lost		2.40	1.05	122,124	0.55	ST, RT, BT, COT
Soda	3.90			113,117, 124	—	ST, RT, CT, COT
Soda Cr. Tributary		0.40		113,124	—	CT
Long Prairie			0.50	108	—	SD
Spencer	0.75	1.10		147	1.35	RT, BT, KSS, SD
Spencer Cr. Trib.	0.50	0.50		147	—	BT
Clover			0.50	147	0.50	RT
Totals	**48.25**	**40.00**	**20.10**		**20.40**	

Key To Symbols

CHS	Chinook Salmon	PL	Pacific lamprey	JCS	Jenny Creek sucker
COS	Coho Salmon	LB	Largemouth bass	SD	Speckled dace
ST	Steelhead trout	BG	Bluegill sunfish	KO	Kokanee
RT	Rainbow trout	RS	Redside shiner	PK	Pumpkinseed sunfish
CT	Cutthroat trout	COT	Cottid (sp.)	GS	Golden shiner
BT	Brook trout	MOS	Mosquitofish	UNA	Unallotted Area
KSS	Klamath smallscale sucker	BB	Brown bullhead		

[1] Refer to Appendix G for criteria for evaluating stream habitat condition.

inhibits growth of suitable livestock forage, a situation that will continue under the district's current timber management policy which precludes timber harvest within 100 feet of each side of Class 1 and 2 streams unless it is to the benefit of wildlife.

Streams in the EIS area are considered to be producing fish at 50 percent of potential levels because of water diversions, roads constructed too near to streams, erosion of unsurfaced roads, and a variety of timber harvest practices that historically have provided less than optimum consideration for salmonid habitat needs. Trampling of streambanks and associated riparian vegetation is a significant problem in the eastern portion of the EIS area, but overall is of minor consequence in the entire EIS area.

Other adverse conditions include habitat conditions that are naturally limiting, and trampling of streambanks and associated riparian vegetation by livestock.

Black-tailed and Mule Deer

Almost all of the EIS area is inhabited by significant numbers of either black-tailed or mule deer. The break-off between the mule deer range and the black-tailed deer range is mostly administrative in as much as deer found east of the western Klamath County line are classified as mule deer and deer west of that line are managed as black-tailed deer.

Deer populations have been calculated for a majority of the allotments with population levels of between 50 to 140 deer per square mile being noted. The average deer population levels are between 70 to 90 deer per square mile for an estimated six-month period of time which was generally used due to distinct movements between summer and winter ranges. Specific population estimates and forage demands have been calculated and are on file in the Medford District Office.

Approximately 210,347 BLM-administered acres of crucial deer winter range have been identified within the eastern portion of the EIS area. Deer winter ranges are generally located below 3,000 feet elevations where the dominant habitats are shrubby scabland, oak-woodlands, and small conifer patches which serve as thermal cover. Food-habit studies in the EIS area show that wedgeleaf ceanothus constitutes over 70 percent of the deer's winter diet. Most of the deer winter range is in poor ecological condition. This is due primarily to wildfire suppression and past heavy use by deer and livestock.

Deer summer range is comprised mainly of timberlands ranging in elevation from 3,000 to 6,000 feet. The quantity and quality of the majority of deer summer range is dictated by past and present timber harvesting with clearcutting usually producing more and higher quality forage than any other harvest system. Important summer deer use areas also include the numerous riparian areas and wet meadow habitats.

Elk

Elk populations have shown a steady increase for the last 10 years. To date 42,880 acres of elk winter range have been identified and mapped on public lands in the eastern portion of the EIS area. Presently elk habitat is thought to be in fair to good condition. The intensity of future timber management in combination with cattle grazing, road development, etc. will dictate future elk habitat and hence population trends.

Unlike deer, elk in the EIS area tend to winter at slightly higher elevations on predominantly cut-over timberlands or along major streams such as Jackass, Rancheria, Twincheria, and Big Butte creeks. The amount of forage removed by cattle during the summer months on the elk winter range could play a significant role in winter elk survival due to dietary overlap.

Upland Game Birds

Both species of forest grouse, the blue and ruffed grouse, as well as two species of quail, the California and Mountain quail, inhabit the EIS area in fairly large numbers. The riparian and upland wet meadows provide a large supply of insects and succulent forbs for young birds making them crucial habitat for both grouse and quail brood rearing.

Recent transplants of wild turkeys have resulted in fair numbers of turkeys being established in the Lake Creek (Allotments 121,124), Pokegama Flat (Allotment 102), and Obenchain (Allotment 24) areas. High turkey use is associated with the dry meadow, pine-oak and oak-woodland habitats. Mourning doves are spring through fall breeding residents. Most nesting occurs in the oak-woodland habitat.

Waterfowl

Hyatt and Howard Prairie Lakes are the two main areas of significant waterfowl production on public lands in the EIS area. Approximately 75 geese per year are produced at these two locations. The numerous small ponds and low gradient streams with their associated riparian vegetation also produce numerous broods of mallards, teal, and wood ducks; however, exact production figures on these species are not known.

Cavity Dependent Species

Cavity dependent species are those species that use cavities, either natural or created, in conifer or hardwood trees to reproduce in or escape into. These species are usually classified further as primary excavators or secondary users. Primary excavators are those species that actually dig out or chip out (i.e., woodpeckers) the cavity to nest or roost in. Primary excavators in the EIS area include the pileated, white-headed, and hairy woodpeckers. Secondary users are those species that also use created or natural cavities for reproduction or escape purposes but do not actually do much excavating. Screech owls, wood ducks, and western bluebirds are examples of secondary users.

The amount of cavity dependent species habitat is limited to the conifer and hardwood dominated vegetative types which are declining annually in the EIS area due in large part to timber harvesting that removes most or all of the habitat components (large trees). The need to retain conifer and hardwood communities on certain sites has been recognized by land managers as necessary to meet future habitat needs of cavity dependent species.

Other Mammals, Birds, Reptiles, and Amphibians

Approximately 336 species of wildlife inhabit the EIS area, some of which have been discussed. Representative species of the non-game group include the black-tailed jack rabbit, California ground squirrel, scrub jay, raven, spotted frog, and western rattlesnake. Some species such as the beaver are found only in specific habitats; others such as the deer mouse are widespread. High species diversity is directly correlated to high habitat diversity for animals in this group.

Wild Horses

All unbranded and unclaimed horses in the EIS area as of December 15, 1971, are considered wild and free roaming as defined in The Wild Horse and Burro Act (Public Law 92-195). The Pokegama Herd Management Area (within Allotment 102 - Edge Creek and 107 - Dixie) contains 11,450 acres of public land and has 35 wild horses in the EIS area identified during the base year 1982. Although land administered by the BLM accounts for only 8 percent of the total herd management area, many of the heavy use areas are on public land and are used by portions of the herd for most of the year. Generally, condition of the horses is good, although reproduction appears low. The population has remained stable for a number of years, and there has been no need to gather horses from the herd for population control.

Approximately 14 miles of existing interior fences are located within the herd management area. These include the California-Oregon boundary fence and the Pokegama, Edge Creek, and Long Prairie Fences. Overall range condition within the area is poor. A herd management plan for the entire 145,000 acre area (of private and BLM-administered land) was approved in 1978 and is available for review in the Medford District Office. This plan provides for a maximum herd of 50 wild horses.

Recreation

There are 10 developed recreation sites on public land in the EIS area, and a number of other primitive sites offer opportunities for camping and picnicking. The Rogue Wild and Scenic River provides outstanding recreational opportunities. Forty miles of the Pacific Crest National Scenic Trail enhance hiking and backpacking opportunities in the EIS area.

Examples of high quality opportunities in the EIS area include fishing (Klamath River, Rogue River, Jenny, Vine Maple, Rancheria, and Twincheria Creeks), floatboating (Klamath River, Rogue River), sightseeing (Upper and Lower Table Rocks), boating (Hyatt Lake), hiking (Pacific Crest Trail), and ORV use (Johns Peak-Timber Mountain, Mount Isabelle). Good opportunities are also available for big game hunting throughout the area.

About 1,149,000 recreation visits occur annually on public land in the EIS area. This level of visitor use attributable to public land is about 11 percent of the total recreational visitor use in the area.

Cultural Resources

The BLM has a cultural resource inventory comprised of three classes of inventory (BLM Manual 8111). These classes include survey of existing cultural resource information (Follansbee 1978), field sampling inventories (180,000 acres) and intensive field inventories (18,000 acres). These inventories are consistent with requirements of the Programmatic Memorandum of Agreement between the BLM, Advisory Council on Historic Preservation, and National Conference on State Historic Preservation Officers, dated January 14, 1980.

There are 116 archeologic sites and numerous isolated finds on or near public land within the EIS area. There are 60 inventoried historic sites on or near BLM-administered land within the area, many of which remain unverified in the field. The Rogue River Ranch, Whiskey Creek Cabin and Obenchain Military Wagon Road are currently on the National Register of Historic Places. Most paleontologic sites are on private land, and there are few data dealing with site locations, significance, and conditions.

Visual Resources

Visual resources are the land, water, vegetation, animals, and the other features (as described in this chapter) that are visible on public lands and comprise the scenic quality of the area. Visual resource management (VRM) objectives have been developed based on an inventory and evaluation of scenic quality, visual sensitivity, and distance zone (see Glossary). Examples of highly scenic and sensitive areas include public lands seen from the Rogue and Klamath Rivers, Howard Prairie and Hyatt Lakes, Lake Selmac, and major travel routes within the EIS area.

VRM classes specify management objectives and allow for differing degrees of modification (BLM Manual 8411). Class I provides the highest level of protection for scenic values, and Class IV the lowest level. Public lands in the EIS area are VRM Class I (2 percent), Class II (8 percent), Class III (22 percent), and Class IV (68 percent). VRM class delineations for the EIS area are available in the Medford District Office or Josephine and Jackson-Klamath FEISs (USDI, BLM 1978 and 1979).

Wilderness Values

Under the terms of the Federal Land Policy and Management Act of 1976 (FLPMA), roadless areas of 5,000 acres or more that have wilderness characteristics are to be reviewed within 15 years for possible wilderness designation.

In the EIS area, the 5,410-acre Soda Mountain area has been identified as a Wilderness Study Area (see Glossary).

In the current phase of the wilderness review, the values, resources, and uses within the study areas are analyzed. Public comment has been received which will help formulate a preferred alternative and other alternatives for analysis in an environmental impact statement on wilderness designation of BLM's Oregon Wilderness Study Areas. The draft EIS will be distributed for public review in 1984.

Special Areas

Areas of Critical Environmental Concern (ACECs) are areas on the public lands where special management attention is required to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes, or to protect life and safety from natural hazards (FLPMA Section 103(a)). Of the areas nominated for ACEC consideration during the District's planning process, five have potential for designation. Potential ACECs include Foots Creek Drainage - south portion (1,630 acres), King Mountain Rock Garden (155 acres), Woodcock Bog (120 acres), Eight Dollar Mountain (1,240 acres), and Upper and Lower Table Rocks (1,240 acres).

The 396-acre Brewer Spruce and 120-acre Woodcock Bog areas are currently designated as Research Natural Areas (see Glossary). These areas were designated and are managed primarily for research and educational purposes. The 150-acre Surveyor and 390-acre Lost Lake areas have been identified a potential Research Natural Areas.

The Lower Table Rock, Eight Dollar Mountain, Woodcock Bog, and Brewer Spruce areas have been identified by the National Park Service (NPS) as potential National Natural Landmarks (Chilcote et al. 1976). Designation of a site as a National Natural Landmark (see Glossary), a program administered by the NPS, would not affect BLM jurisdiction to manage the area.

The Hollenbeck Natural Area is currently utilized as an environmental education area (see Glossary), but no formal designation is expected.

An 84-mile segment of the Rogue River was designated a component of the National Wild and Scenic Rivers System in 1968. The designated section administered by BLM extends 47 miles from the mouth of the Applegate River downstream to the eastern boundary of the Siskiyou National Forest. The Rogue River is also a designated Oregon State Scenic Waterway.

The Klamath River has potential for Oregon State Scenic Waterway designation.

Timber Resources

The current Josephine and Jackson-Klamath 10-Year Timber Management Plans were implemented in 1979 and 1980, respectively. The annual allowable cut provides for the harvest of 213 million board feet (Scribner) within the Medford District. Management objectives have been established for commercial forest lands having high intensity, low intensity, or limited management potential. There are about 708,000 acres of commercial forest land in the district of which about 227,000 acres are excluded from the timber production base due to reforestation difficulty.

Socioeconomic Conditions

For the purpose of analyzing the socioeconomic impacts of the alternatives, the EIS area is defined as Jackson and Klamath Counties. The small amount (438 AUMs) of grazing activity on BLM lands which occurs outside these two counties would not be affected by any of the alternative actions.

Data on existing conditions are for the year 1983 except where otherwise indicated.

Population and Income

The population of the EIS area in 1982 was estimated to be 192,925 persons, a small increase from the 1980 population of 191,573. Population growth during the 1970's averaged about 2.9 percent per year, however, the growth between 1980 and 1982 was 0.4 percent per year (Oregon Center for Population Research, 1982). Total personal income in 1981 was $1,671 million. Income per capita was $7,807 as compared with a statewide average of $10,009. The portion of income attributable to the work force (i.e., labor and proprietors income) amounted to $1,078 million of which $201 million was farm income (U.S. Department of Commerce, 1983).

Economic Activity

The labor force, people working or looking for work, averaged 89,960 in 1982. Unemployment was 14.3 percent of the labor force. Agricultural employment in 1981 totalled 5,202 workers including 2,854 farm and ranch proprietors and 2,348 wage and salary workers (U.S. Department of Commerce, 1983). The industrial composition of non-agricultural wage and salary employment in 1982 is shown in Table 2-6.

Table 2-6 Non-agricultural Wage and Salary Employment, 1982 (Average number of workers)

Industry	Employment	Percent
All industries	57,250	100.0
Manufacturing	10,320	18.0
Lumber and wood products	7,300	12.8
Food products	460	0.8
Other manufacturing	2,560	4.5
Construction	1,320	2.3
Transp., commun. & util.	3,150	5.5
Trade	15,490	27.1
Finance, insurance, real estate	2,910	5.1
Services	11,100	19.4
Government	12,960	22.6

Source: Oregon Department of Human Resources, 1983b.

The value of agricultural production in 1982 was $114.6 million including $54.7 million in sales of livestock and livestock products and $60.0 million in crops sold. The value of cattle and calves sold was $39.4 million. There were 72,000 beef cows and a total of 170,000 cattle and calves in the two counties on January 1, 1982. (Oregon State University, Extension Service, 1983a, 1983b.)

The business of livestock production creates additional local sales activity through the purchases by ranchers and by their suppliers. A portion of these gross sales are earned by individuals as personal income. The relationship of ranchers' sales to personal income generated has been estimated for this area from an inter-industry model developed by the Forest Service (USDA, FS 1983). (See Appendix H.) Applying this estimate to 1982 livestock sales figures, the total personal income generated locally by livestock producers in 1982 was $39.6 million.

The following section describes several measures of the value of BLM grazing privileges to the livestock industry, and estimates the amount of local income and employment generated by the existing level of activities arising from public land use.

Dependence of Livestock Products on Public Forage

During the 1982 grazing year (3/1/82-2/28/83) 105 lessees held grazing privileges on public lands in the EIS area. Their active preference (see Glossary) totaled 22,496 AUMs, and their active (paid) use in 1982 was 17,246 AUMs. They reported total herds of 22,377 cattle which is about 31 percent of the beef cattle in Jackson and Klamath counties in 1982. Assuming 12 AUMs of forage for each animal per year, use of BLM forage provided 6 percent of lessees' forage requirements.

Four lessees were dependent on BLM forage for more than 40 percent of their annual requirements. The use of BLM forage is heaviest during spring and summer and comprises 90 to 100 percent of the forage requirements for a month or more during that season for 16 of the lessees.

BLM Grazing Privileges and Ranch Property Values

The Bureau of Land Management does not treat grazing leases as vested property rights; however, effects on private asset valuation may occur. Based on BLM file data and contract appraisal studies, the asset value of public forage is estimated to be $40-$45 per AUM. Estimates of the capitalization values placed on grazing privileges associated with the selling of ranch properties have varied widely from this estimate. Grazing privileges have sold at prices ranging from $22 to $55 per AUM in southern Idaho according to the Owyhee Grazing Management FEIS (USDI, BLM 1980c), and an average price of $65 per AUM was indicated in interviews with parties to the sale of several ranch properties in eastern Oregon during the years 1977 to 1979 (USDI, BLM 1980d).

Local Income and Employment Effects

Based on public forage use in 1982, the portion of forage derived from public lands in Jackson and Klamath Counties accounted for about $344,000 in local personal income and 10 jobs. Appendix H shows how these estimates were made.

Other Land Use Activities

Timber production, mining, hunting, fishing and other recreational activities are other uses of the public lands in the EIS area.

Social Conditions

Social conditions that might be affected by any of the alternatives are primarily those relating to the residents and communities of Jackson and Klamath Counties. Groups interested in these public lands include ranching, timber and mining industries, and conservation, wild horse, historical, archaeological, hunting, fishing or other recreation-oriented groups and organizations.

The group most likely to be affected is the ranching industry. The ranchers' livelihood and style of life is tied to the land and to the ranch operation.

Chapter 3 Environmental Consequences

Introduction

This chapter describes the significant environmental consequences that would result from implementing each of the alternatives. These environmental consequences (impacts) are compared to the existing situation, as described in Chapter 2. If a resource is not affected or if the impacts are considered insignificant, no discussion is included. Analysis, including the scoping process, indicates that there would be no significant impacts upon air quality, minerals, climate, or energy consumption.

Major actions that cause impacts are (1) allocation of existing and future forage production, (2) implementation of grazing systems which include changes in period of use, and (3) development and maintenance of range improvement projects. Because no change is expected from the existing situation on the unallotted areas (516,000 acres), these areas are not discussed further.

The following assumptions have been made as a basis for the impact analysis:

- No impact would occur if resource conditions would remain the same as the existing situation.

- Short term impacts would occur during the 10-year period needed to complete range improvement projects and implement grazing systems. Short term impacts would normally occur within 1 to 2 years after development of improvements and implementation of systems. Until implementation, the impacts of grazing management would be the same as under the No Action Alternative (Alternative 1).

- Long term impacts describe conditions that would occur during the 15 years following implementation of the decision.

- Each alternative selected would be fully implemented as described in Chapter 1. The period of implementation would be 10 years.

- Vegetation is the primary resource that would be directly impacted. Changes in vegetation production or composition would affect other resources.

- Grazing systems would be followed.

- Monitoring studies would be conducted as described in Appendix D, and adjustments in management would be made as needed.

- Standard procedures and design elements would be effectively carried out for development of range improvement projects in each alternative (see Appendix D).

- Regular maintenance would be carried out to maintain the functional capability of all range improvements.

Impacts on Vegetation

Changes in vegetative characteristics such as forage production, ecological or forage condition, riparian vegetation and threatened or endangered plants are dependent upon changes in plant species composition. A summary of the long-term impacts to vegetation is shown in Table 3-1.

The majority of habitat work proposed would occur in the Dry upland zone (see Figure 2-1 and Table 2-1). Brush control, hardwood removal, meadow seeding and other seeding would generally be accomplished on the following sites:

Table 3-1 Long-Term Vegetation Impacts

Vegetative Characteristics	Existing Situation	Alt. 1 No Action	Alt. 2 Emphasize Livestock	Alt. 3 Preferred Alternative	Alt. 4 Emphasize Non-Livestock
Ecological Condition (68,041 Acres)					
Late	1,361	1,361	3,402	5,443	3,402
Middle	19,051	19,051	40,145	29,258	30,618
Early	47,629	47,629	24,494	33,340	34,021
Forage Condition Coniferous Forest (329,014 acres)					
Good	3,290	3,290	6,580	6,580	3,290
Fair	29,611	42,772	65,803	52,643	72,383
Poor	138,186	125,025	98,704	111,864	95,414
Unknown	157,927	157,927	157,927	157,927	157,927
Range Trend (68,041 Acres)					
Up	9,526 (14%)	9,526 (14%)	44,907 (66%)	46,268 (68%)	45,588 (67%)
Static	47,629 (70%)	47,629 (70%)	15,650 (23%)	14,289 (20%)	14,969 (22%)
Down	5,443 (8%)	5,443 (8%)	2,041 (1%)	2,041 (1%)	2,041 (1%)
Unknown	5,443 (8%)	5,443 (8%)	5,443 (8%)	5,443 (8%)	5,443 (8%)
Long Term Forage Production (AUMs)	132,543	131,998	155,548	147,507	145,309
Streamside Riparian Vegetation Trend (104.25 Miles)					
Up	24%	24%	30%	58%	78%
Static	62%	62%	64%	37%	22%
Down	14%	14%	6%	8%	0%

A. Brush Control: Shrubby scabland
B. Hardwood Removal: Oak-pine-oatgrass, oak-pine-fescue, mahogany-oak-fescue, pine-oak-fescue
C. Meadow Seeding: Dry meadow, semi-wet meadow
D. Other Seedings: Steep foothill grassland

In the remaining 11 zones, vegetative impacts would result from seeding cut-over coniferous forest sites and rehabilitation of semi-wet, wet, and grassland sites.

Expected changes in key species would occur in nearly every vegetation type, although in somewhat different proportions depending upon the present composition and potential of the site and the actions being proposed.

Plant Species Composition

The following analysis identifies the general changes in composition of key species that are expected to result from the components of each alternative, i.e., forage allocations, grazing systems and range improvements. (See Table 1-1 for components by alternatives.)

In the oak-woodland sites, species composition of white oak would change under the alternatives as a result of woodland thinning and hardwood removal from an average of 45 percent to no less than 10 percent canopy cover, and increased ground cover of natives and seeded species to a minimum of 50 percent cover in the treated areas.

In treated brushland sites, species composition would change as wedgeleaf ceanothus brushfields are burned to rejuvenate decadent stands and seeded with a grass-legume mixture. Projects are designed so that no more than 25 percent of the wedgeleaf sites would be treated in a 10-year period in a given deer winter range.

Estimates of changes in composition of key species were based upon observation, professional judgement, analysis of present grazing systems in the EIS area, studies, and a recent vegetation inventory.

Forage Allocation and Grazing Systems

Proposed utilization levels (see Glossary) would be 60 percent or less in an allotment under all alternatives. This section discusses the effect of proposed utilization levels and grazing systems on key species composition.

For the purposes of analysis, light utilization is defined as up to 40 percent, moderate utilization is defined as from 41 to 60 percent, and heavy utilization is defined as 61 percent and over. Generally, light and moderate utilization levels increase or sustain the vigor of key species, while heavy utilization reduces leaf surface below levels needed to maintain root reserves, diminishing the vigor of key species (Heady 1975). However, under most grazing systems, the timing of grazing use is the most important factor affecting key species composition. For example, during the critical part of the growing season (normally April 15 to July 15, depending on elevation, shown in Table 1-3) plants are drawing on stored carbohydrates to develop flower stalks and vegetative growth. In most native key species, carbohydrate reserves are replenished during the later stages of this period after seedripe. The critical period of growth ends when the plant has replenished its carbohydrate reserves and has produced seed. Moderate utilization during the period of critical growth may result in reduced vigor, evidenced by fewer seedstalks, lower vegetative production and a smaller crown size. Heavy grazing during this period can completely deplete plant reserves, eventually killing the key species and allowing a corresponding increase in less palatable plants.

Winter Grazing System - Decreases in herbaceous key species are expected under this system due to high rainfall, soil compaction and trampling of vegetation. Winter grazing on woody species reduces carbohydrate reserves, because shrubs store carbohydrates in the above ground stems. Moderate utilization of shrubs is expected to result in production of fewer flowers in the spring and eventually decadent stands of shrubs.

The composition of key herbaceous and woody riparian vegetation would increase under winter grazing. In cool weather, livestock are less inclined to seek out the forage, shade, and water provided by riparian areas, thus, light or no utilization in these areas would occur.

Spring Grazing - Under this system, grazing occurs for one to two months during the growing season. Although the proposed stocking rates are designed to achieve moderate levels of utilization, heavy grazing inevitably would occur on some portions of an allotment and light use on others. In the early part of the spring grazing season, livestock make extensive use of annual and other less palatable species. By the middle of May, preference shifts from annuals to perennial grasses. In general, most cattle would be removed on spring range allotments before the soil moisture necessary for perennial plant growth is depleted.

Light utilization on key upland woody species is expected under early spring grazing. Consequently, a long term increase in composition of these species would occur in areas where a potential for increase exists because plant vigor and reproduction would be maintained.

Key woody and herbaceous riparian vegetation would increase in composition under this system. Better distribution of livestock because of cool weather, abundant green upland forage and more water sources would decrease use on riparian vegetation. Regrowth after grazing would occur because of adequate soil moisture in the riparian areas.

Spring/Summer Grazing System - Grazing occurs every year during the critical part of the growing season under this system. Although the proposed stocking rates are designed to achieve moderate levels of utilization on most areas, factors such as terrain, location of fences and water, and the type of vegetation found in the Medford EIS area often prevent uniform patterns of grazing. Heavy grazing inevitably would occur on some portions of an allotment and light use would occur in other areas. A decrease in composition of key native, upland herbaceous and woody species is expected on those areas within an allotment that receive heavy utilization — primarily areas adjacent to water developments, riparian areas, and flat valley bottoms.

Decreases in key woody and herbaceous species are expected in riparian areas accessible to livestock under spring/summer grazing. Livestock prefer green forage. Consequently, as upland herbaceous species become dry in late summer, livestock begin grazing green herbaceous and woody species in accessible riparian areas, and heavy utilization generally occurs.

Summer Grazing - This system allows livestock grazing through the plant's growing season. The majority of summer grazing takes place in the forested zone (see Figure 2-1) on logged areas. Forage is temporary in nature and is generally shaded out due to increased canopy of conifers within 20-25 years. Stocking rates are designed to achieve moderate levels of utilization. Preference is high in the early part of the summer for grasses and decreases progressively with plant maturity, and increases in preference respectively for forbs and shrubs. Consequently, as herbaceous upland species become dry in late summer livestock begin grazing green herbaceous and shrubby species in riparian areas, and heavy utilization may occur.

Deferred Rotation Grazing System - Under this system grazing would take place during the growing season until seed ripe of grass key species (approximately 1-1/2 - 2 months grazing) and then cattle would be rotated to another pasture. Under this system pastures would be allowed to rest through the growing cycle every other year. In the alternate year, grazing would take place after seed ripens.

At moderate utilization levels, this system would allow adequate root storage and an increase in key herbaceous species would occur. Under heavy utilization levels, root storage during the year of deferment would only be adequate to offset depletion that would occur during the year of grazing use, and herbaceous key species composition would not be expected to change. Woody key species composition in upland areas would not change under moderate utilization and would decrease at heavy utilization levels. Because of the short duration of the season, the composition of woody species would not decrease under this system. Concentration of livestock in riparian zones is expected to decrease. Fecal analysis data indicates that cattle prefer grasses in the early part of the summer season and decreases progressively with an increase in forb and shrub intake. By rotating cattle to green feed for the remaining part of the season (1-1/2 to 2 months) experience has shown a reduction in livestock concentrations in riparian zones.

Rest Rotation Grazing System - Rest rotation grazing alternates one or more years of complete rest with other grazing treatments. The length of the rotation cycle and number of grazing treatments depend on the number of pastures in the grazing system.

The first type of rest rotation (RR2) alternates 1-1/2 to 2 months of spring or summer use grazing with one complete year of rest. Herbaceous and woody upland species would not change in composition at heavy use levels because the year of rest provides a recovery period from the previous year's grazing. At light or moderate utilization levels, these species would increase in composition. Riparian key species composition would be maintained at existing levels because the heavy utilization made on these plants during partial season grazing would be offset by the year of rest.

The second type of rest rotation (RR3 and RR4) alternates one, 2 or 3 years of grazing during the growing season with 1 year rest. Because cattle are only in pastures for 1 or 2 months, adequate soil moisture remains in pastures to allow plants to complete their growth cycle. This system would increase the composition of all upland and riparian

key species because early spring grazing allows plants to complete regrowth and replenish carbohydrate reserves. The year of rest further ensures reproductive success and seedling survival of key species.

Exclusion - No authorized livestock grazing is permitted in exclusion areas. An initial improvement in the vigor of key species would occur because the absence of grazing during the growing season would allow plants to complete vegetative growth and reproduction. Where the potential exists, a rapid increase in riparian woody species is expected during the first 5 years of exclusion. Observations of woody streamside riparian vegetation in the Medford District indicate that during the first few years of protection from grazing, rapid shoot growth and establishment of seedlings occur.

Range Improvements

The development of range improvements (Appendix D, Table D-1) would cause a short term and long term disturbance of vegetation as shown in Table 3-2. In addition, a decrease in the composition of key species would occur on 5 acres around each new water development as a result of heavy utilization. The largest change in species composition would be caused by the proposed vegetation manipulation.

On the shrubby scabland sites and manzanita brushfields seral stage, wedgeleaf ceanothus shrubs cannot be improved with grazing systems as this species requires fire to perpetuate healthy stands. Therefore, brush control by burning and seeding is proposed to rejuvenate these decadent stands. The acres of the shrubby scabland site being treated (see Table 1-1) represent approximately 25 percent of the sites under Alternative 2, 16 percent under Alternative 3, and 27 percent under Alternative 4.

Under these alternatives, about 10 percent or less of the manzanita brushfields would be treated. No vegetation manipulation is proposed under Alternative 1.

The proposed methods of brush control are burning, mechanical, and chemical. Burning would rejuvenate the decadent stands of wedgeleaf ceanothus which are important deer browse during the winter months. Mechanical treatment would be more effective on manzanita brushfields. The effect of burning on perennial grasses would be minimal because there are few at this stage.

All areas proposed for brush control would be seeded with a grass-legume mixture on 11,682 acres under Alternative 2; 4,469 acres under Alternative 3; and 7,894 acres under Alternative 4.

The proposed methods of hardwood treatments would be mechanical and hand removal. For the most part, past wild fires have caused sprouting of white oaks resulting in increased canopy cover and reduced ground cover. Improvement in range condition cannot be solely accomplished through use of grazing systems. Forage production and range condition would improve as a result of hardwood thinning.

The acreage of vegetation manipulation shown in Table 1-1 represents approximately 30 percent of the hardwood sites under Alternative 2; 17 percent under Alternative 3; and 13 percent under Alternative 4. No vegetation manipulation is proposed under Alternative 1. All areas being proposed will be seeded with a grass-legume mixture on 12,577 acres under Alternative 2; 6,999 acres under Alternative 3; and 5,124 acres under Alternative 4.

Table 3-2 Acres of Vegetation Disturbance Due to Proposed Range Improvements [1]

Range Improvements	Alternative 2 Emphasize Livestock (Acres)			Alternative 3 Preferred Alternative (Acres)			Alternative 4 Emphasize Non-Livestock (Acres)		
	Temp.	Perm.	Heavily Grazed	Temp.	Perm.	Heavily Grazed	Temp.	Perm.	Heavily Grazed
Fences	167	0	0	109	0	0	103	0	0
Corrals	9	9	0	6	6	0	3	3	0
Ponds	29	29	290	19	19	185	26	26	225
Springs	14	0	340	9	0	220	13	0	325
Hardwood Removal/seed	12,577	0	0	6,999	0	0	5,124	0	0
Brush Control/seed	11,682	0	0	4,469	0	0	7,894	0	0
Meadow Seeding	3,615	0	0	2,474	0	0	1,987	0	0
Total	**28,093**	**38**	**630**	**14,085**	**25**	**405**	**15,150**	**29**	**550**

[1] See Table 1-1 for proposed range improvements by alternative. There would be no range improvements constructed under Alternative 1.

Meadow improvement would be by discing and/or use of herbicides to control noxious and competing weeds (i.e., Tarweed, medusa head, cucumber, etc.)

Approximately 77 percent of the meadow sites would be treated under Alternative 2; 53 percent under Alternative 3; and 43 percent under Alternative 4. No vegetation manipulation is proposed under Alternative 1. All areas being proposed will be seeded with a grass-legume mixture on 3,615 acres under Alternative 2; 2,474 acres under Alternative 3; and 1,987 acres under Alternative 4.

The proposed method for seeding cut-over forest areas with a grass-legume mixture would be accomplished aerially by helicopter or with hand seeders. By seeding cut-over forest areas with a palatable grass-legume mixture, vegetation competition with trees can be controlled with livestock. Beneficial impacts of nitrogen fixation from legumes would also occur. Krueger et al. (1983) indicate that the introduction of grass forage species through seeding in the Wallowa Mountains of northeast Oregon, combined with grazing in Douglas-fir/ponderosa pine plantations provided a high level of brush control. Grazing was not detrimental to plantation development, and conifer trees in the grazed pastures showed greater height growth than the pasture protected from cattle grazing. For further information, see the section in this chapter dealing with impacts on timber resources.

The acreage of forest seedings is shown in Table 1-1, and represents approximately 2 percent of the coniferous forest sites under Alternative 2; 1-1/2 percent under Alternative 3; and less than 1 percent under Alternative 4.

Additional grass-legume seedings on foothill, mountain, and high mountain grassland sites represent approximately 42 percent under Alternative 2; 18 percent under Alternative 3; and 13 percent under Alternative 4. No seedings are proposed under Alternative 1. Seeding will be done by manual broadcast or aerial methods. The acreage of grass-legume seeding is shown in Table 1-1.

New spring developments would cause a permanent decrease in upland key species composition on 220 to 340 acres surrounding the new water source due to heavy utilization and trampling by livestock concentrating in the area. As these springs are developed, water would be diverted to livestock water troughs and fencing would protect riparian vegetation where significant overflow occurs. Consequently, a net increase would occur over the long term in both woody and herbaceous riparian key species near springs.

Range Condition and Trend

The future range condition of the area is dependent upon the changes in species composition described in the previous section. In the dry upland zone (see Figure 2-1) range condition classification is based on ecological potential. In the remaining zones, forage condition is dependent on logging activity and is based on forage value of plants that increase from logging activity. Expected long term condition changes (shown in Table 3-1) are based on several assumptions derived from inventory data, observation, study data, pertinent literature and professional judgment. Appendix E discusses the methodologies used to predict condition and trend. The assumptions used to predict future range condition include the following:

- Grazing systems and use levels that satisfy the physiological requirements of key species for growth, reproduction and carbohydrate storage (see Plant Species Composition section) would improve range condition from a middle to late condition class. Conversely, systems and use levels which do not allow plants the opportunity to make and store carbohydrates would result in the deterioration of range condition from late to middle and middle to early. Cook (1971) states that" Carbohydrate reserve exhaustion can be the primary cause of changes in range condition. The more palatable species are grazed more intensively and frequently than unpalatable plants. The carbohydrate reserves in the heavily grazed plant are gradually reduced while the less palatable species have optimum reserves." Numerous other studies support this. The "range condition" described in this study correlates with the definition of range condition used in the dry upland zone for this EIS.

- It is assumed that of the 47,613 acres of early condition range there will be improvement from early to mid condition on 13,000 to 23,000 acres depending on the alternative selected. This prediction is based on a recent range inventory which indicated many acres in early condition were borderline with mid condition class and would respond to grazing systems and treatments. It is assumed that the remaining acreage in early condition class would not respond to grazing management over the long term without some type of land treatment.

- Available nutrients and soil moisture are fully utilized by the present vegetation. Consequently, any increase in the amount of key species would result in a similar but opposite change in the amount of some other species.

- Brush control and seeding in non-timber types would be implemented on sites in early or low mid condition class which would be rated as excellent forage condition 10 years after completion of the project. Brush control would be implemented only on early range condition sites which would be in excellent forage condition after 15 years.

- Seedings in partial and final conifer overstory removals would be rated in excellent forage condition after 5 years, but would be transitory with a life expectancy of 10 to 15 years.

Forage Production

Forage production is expected to increase significantly under all alternatives except Alternative 1. The future forage production presented in Table 3-1 and Appendix B, Table B-1 was predicted using the methodology outlined in Appendix C. The future forage production of both seeded and native range was based upon present production and potential production based on similar treatments, such as the Big Butte allotment (#24) and others in the EIS area.

Residual Ground Cover

The long term total residual ground cover shown in Appendix B, Table B-1 would not change, unless it is allocated for other uses, or lost on timbered sites that have been harvested, planted with trees, and ground cover is lost due to an increase in canopy cover. Approximately 40 percent of herbaceous ground cover would remain in allotments as residual ground cover.

Threatened, Endangered, and Sensitive Plants

Site specific information concerning the impact of existing livestock grazing management is lacking for the 18 plant species under review for Federal listing as threatened or endangered status and the 40 plants considered as sensitive by BLM (shown in Table 2-3). For example, under Alternative 4, beneficial impacts could occur to plants which are palatable to livestock and are located within the proposed exclusion areas. The removal of livestock could allow these plants to expand into adjacent suitable habitat. On the other hand, livestock exclusion could favor plants which are preferred by livestock and which may be in competition with the sensitive plants. Without information about the response to grazing, the impact of proposed changes in grazing management cannot be predicted. Adverse impacts due to vegetation manipulation and range improvement construction would be avoided by conducting intensive plant inventories of the project area and modifying the design as needed in accordance with Bureau policy (Appendix D).

Impacts on Soils

The development of range improvements under Alternatives 2, 3, and 4 would temporarily disturb the soil surface. The disturbance would subject those areas to water erosion. The surface erosion would be minimal and the impacts would lessen as the areas became revegetated in 1 to 2 years. No range improvements would be developed under Alternative 1.

Livestock would concentrate around the proposed water developments. Approximately five acres would be heavily grazed around each spring and pond (see Table 3-2). Residual ground cover would thus decrease and erosion would slightly increase. Upland erosion would also increase along some new fence lines under Alternatives 2, 3, and 4 due to trailing by livestock. Tractor scarification and burning would temporarily increase soil erosion.

Streambank erosion would be affected by changes in riparian vegetation (see Table 3-1) and would coincide with changes in streamside riparian vegetation trend. Increases in riparian vegetation, especially woody plants, would help stabilize streambanks and decrease erosion. Increases in riparian vegetation would occur under Alternatives 2, 3, and 4 on portions of the streambanks identified as having significant livestock damage (see Table 2-5). This would be primarily the result of decreases in livestock concentrations in riparian areas.

Impacts on Water Resources

Water Quantity

A number of studies (Rauzi and Hanson 1966; Alderfer and Robinson 1974; Hanson et al. 1972) have shown that heavily grazed upland areas in poor condition produce more runoff than lightly and moderately grazed areas and areas in good condition. Soil compaction may increase runoff by decreasing the rate of infiltration of water into the soil. The expected improvement in range condition under Alternatives 2, 3 and 4 would result in a slight decrease in total runoff. However, no significant change in water quantity is expected under all alternatives.

Peak flows may moderate slightly, and the implementation of deferred and rest rotation grazing systems along streams may lead to perennial flows along reaches of streams that were intermittent. Winegar (1980) found that a previously intermittent stream began to flow year long after several years of protection from livestock grazing. Stream sections outside the exclosure continued to go dry during the summer. He attributed the additional duration of water yield to dense riparian vegetation inside the exclosure that trapped silt and built up the water

table by several feet. Under Alternatives 1 and 2, the water table may be lowered in some stream sections because of soil compaction and vegetation removal by livestock. Alternatives 3 and 4 would result in raised water tables and increased summer flows in some localized streams.

The total impoundment of water due to the construction of ponds under Alternatives 2, 3, and 4 would not significantly decrease the water reaching downstream users. The ponds would each hold approximately .25 acre-feet and the total impoundment under any alternative would be much less than 0.1 percent of the annual runoff from public lands in the EIS area.

Water Quality

Chemical constituents are not likely to change because the chemical composition depends on the source of the water and the geological substrate. Most fecal coliform increases come from livestock use in or directly adjacent to streams (Johnson et al. 1978; Robbins 1978). Managing livestock along streams in riparian areas under Alternatives 3 and 4 would reduce or remove livestock concentration along perennial streams and thus decrease fecal coliforms from livestock. Under Alternatives 1 and 2, fecal coliform levels would remain the same as the present situation.

Chemical methods of controlling unwanted vegetation can affect water quality. No significant impacts to water quality would be expected due to the use of buffer strips 100 feet wide on both sides of perennial streams and around other water sources (see Appendix D, Standard Procedures and Design Elements for Range Improvements).

Some herbicides could also enter streams in surface runoff or through erosion of soil previously treated with herbicides. Leaching of herbicides through the soil to the water table and to nearby streams is unlikely.

BLM monitors water quality in conjunction with many spray operations. Water samples are collected at times when detection of herbicides is most likely, i.e., in the first 24 hours following herbicide application (to measure concentrations from accidental drift) and during the first major post-spray rainfall event (to measure concentrations carried by surface runoff or soil erosion).

The development of range improvements would temporarily increase the existing sediment yield in local stream reaches. The disturbed acres are expected to become revegetated within 1 to 2 years. After revegetation, sediment yields would return to the previous levels or lower.

Improvement of riparian vegetation and increased streambank stability resulting from exclosures and grazing management under Alternative 4 and to a lesser extent under Alternative 3 would decrease sediment yields. Also, as woody riparian vegetation increases, shading of the streams would occur, resulting in lower water temperatures.

Impacts on Wildlife

Wildlife would experience both primary and secondary impacts. Primary impacts affect wildlife populations directly. Some examples of adverse primary impacts are: avoidance of livestock use areas by deer and elk; nest disturbance or destruction from livestock trampling; temporary animal displacement from prescription burning and removal of oaks containing animal nests.

Secondary impacts affect wildlife populations indirectly by changing the vegetation or wildlife habitat and can be beneficial or adverse. Two adverse examples are loss of feeding and reproducing habitat for certain cavity dependent species when oak-woodlands are thinned and loss of some vegetative structure and hence inherent diversity within the stand under intensive grazing systems. Beneficial examples include increased forage quality especially on deer winter ranges through cutting, burning, and seeding on "wooded" sites and increased vegetative structure and diversity in improved riparian zones.

Wildlife populations in the EIS area have had only limited monitoring to determine the impact of grazing systems and range improvements. Therefore, impact analysis was based on less direct methods which focus on wildlfie habitat. Some considerations in predicting impacts were:

1) Condition of habitat as based on visual observation by district personnel and existing habitat inventory.

2) Potential of wildife habitat to respond to a specific grazing system, livestock exclusion, or range improvement.

3) Predicted impacts to vegetation as they affect wildlife.

4) Research applicable to the EIS area (Culbertson and Montgomery 1982a and b).

5) Research applicable to similar habitat types (Thomas et al. 1979).

6) Field observations of past impacts to wildlife populations and their habitat.

All predicted impacts to populations are based upon anticipated habitat changes. Weather, hunting, disease, and predation were assumed to be constant. Actions which increase habitat diversity were assumed to also increase the numbers and kinds of wildlife although improved habitat does not always result in immediate increases in populations. Predation or adverse weather may reduce population levels.

Exposure to acute toxic levels of herbicide by wildlife is not anticipated as none of the herbicides proposed for use have been reported to be highly toxic to animals when used in accordance with manufactures' labels. Animals are unlikely to ingest toxic amounts of herbicides at levels applied in range management since herbicide spray is very unlikely to contact all forage in animals home range. With a maximum herbicide deposition rate of 4 lbs/acre, an animal consuming 3 percent of its body weight in food/day would be unable to approach toxic levels of consumption. Some animals are repelled by herbicide residues on their natural food and will forage elsewhere following a spray project.

Chronic (long-term) effects of herbicides on wildlife are not anticipated. Animals are not likely to be exposed to repeated treatments, and herbicide residues ingested by them are readily excreted, tending not to concentrate in body tissues (Newton and Norris 1968).

Diesel oil is often used as a carrier for herbicides, reducing the amount of herbicide required. Diesel oil can coat eggs, reducing hatching success (Kopischke 1972), and can coat birds, increasing their vulnerability to other environmental stresses such a predation and hypothermia. Spring application of herbicides in diesel oil carriers may reduce nesting success of some birds.

Threatened and Endangered Animals

None of the proposed alternatives would have an affect on peregrine falcons or bald eagles. Changes in bird and small mammal populations would not be great enough to significantly affect food for bald eagles or peregrine falcons. Active nesting or roost sites will not be impacted by any rangeland improvement practices.

Trend in habitat quality for the Jenny Creek sucker would continue downward on portions of Jenny Creek and Corral Creek (allotments 107 and 110) under Alternative 1, primarily because of streambank trampling and loss of riparian vegetation (Appendix G, Table G-2). Trend on other portions of the species' habitat would remain static. Under Alternative 2 habitat trend due to livestock grazing would stablize on 8.1 miles of Jenny Creek, Corral Creek and Keene Creek in allotments 107, 108, 110 and 115. Habitat condition would not change between Alternatives 1, 2 and 3 due to the slow recovery of streambank vegetation, but would markedly improve under Alternative 4 due to the expected accelerated rate of recovery of riparian vegetation within exclosures.

Wildlife Habitat in Riparian Areas

Impacts in riparian areas are significant because these areas are limited in distribution and acreage (less than 5 percent of the total land base) and contain the greatest habitat diversity and hence the greatest densities and varieties of terrestrial wildlife species. Of the 336 species known to inhabit the public lands in the EIS area, approximately 70 percent feed or reproduce in the riparian areas. See Appendix G, Table G-1 for location of major Class 1 and 2 stream riparian areas.

Impact predictions were made by comparing existing grazing systems and present condition and trend with proposed grazing systems on Class 1 and Class 2 streams only. Class 1 and 2 stream miles shown on Table 3-3 represent only approximately one-fifth of the significant riparian areas in the EIS area. A 5 percent sample of the riparian areas on the other Class 3-5 streams showed approximately the same types of and amounts of problems, conditions, and trends as did the Class 1 and 2 streams. Therefore, the riparian areas in the Class 1 and 2 streams are used as being representative of a much larger (5x) area. Impact predictions were also made from the grazing system narratives (see the impacts on vegetation section and Table 3-3). For example, an increase in key riparian species would result in additional structure and would result in an upward wildlife habitat trend.

Livestock exclusion would improve riparian habitat to good or excellent condition where livestock grazing has been identified as the limiting factor for riparian habitat. Most of the improvement would occur during the first 5 to 10 years. Successful streambank fencing projects have been documented in Oregon (Winegar 1977), Utah (Duff 1978), and Nevada (Crispin 1981).

Livestock exclusion along sections of Long Prairie and Beaverdam Creeks in the EIS area have allowed both woody and herbaceous plants to increase, resulting in increased habitat diversity. Similar riparian areas that would improve significantly under Alternatives 3 and 4 are Jenny and Clover Creeks, sections of Dead Indian and Jackass Creeks, and others. Decreases in riparian plant species would result in poor wildlife habitat where watergaps in fences are constructed.

Other than exclusion, proposed grazing systems would improve riparian habitat for wildlife at a very slow rate over 15 to 20 years. Some grazing systems (e.g. 2-pasture deferred rotation) would not result in any appreciable improvement in riparian habitat but may stop the present downward trend.

Under Alternative 1, the present downward trend in riparian areas would continue. Under Alternative 2, significant improvement of riparian habitat would be very slow because of: (1) funding constraints would not allow for new grazing systems and/or range improvements, i.e., fences, seeding, etc., on some allotments (e.g. 108,207) that are experiencing downward trends in the riparian habitats and (2) increased cattle numbers under deferred rotation grazing and/or present grazing systems on some allotments (e.g. 31,106) would not improve existing conditions in riparian areas at a very appreciable rate.

Under Alternative 3, which employs both some livestock exclusions and grazing systems keying in on managing for habitat diversity, there would be significant changes in trends, and although slow, the overall condition of the riparian areas would improve.

Alternative 4 proposes complete exclusions of livestock after June 15 either by fencing or removing livestock on those riparian areas presently impacted by livestock. Under Alternative 4 the improvement of the riparian areas would be much faster than under Alternatives 2 or 3.

The increases in plant diversity and structure under Alternatives 3 and 4 would result in an upward trend in habitat values.

Development of springs would temporarily destroy some wildlife habitat at each spring site; however, the long term impacts would not be significant as adequate water for wildlife and fencing of overflow areas is expected under all alternatives.

Fish

The analysis of impacts to fish habitat is based on expected impacts to riparian vegetation, water quality, streambank stability and erosion in uplands. Grazing systems and range improvements that would increase or decrease riparian vegetation would also generally improve or deteriorate fish habitat. Increased amounts of riparian vegetation can reduce water temperatures, trap sediment in root systems and decrease channel width, increase summer flows and increase the availability of terrestrial insects. Dense riparian vegetation stabilizes streambanks and provides hiding cover for fish. Pool quantity and quality can be improved by decreased stream width, increased stream depth and by beaver dams, provided abundant woody vegetation is available and beaver populations are controlled.

Table 3-3 Riparian Habitat on Class 1 and 2 Streams -Condition and Trend [1]

Condition

	Existing		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
	Miles	Percent	Miles	Percent	Miles	Percent	Miles	Percent	Miles	Percent
Poor	4.35	4	8.85	8	5.75	5	3.50	3	0.00	0
Fair	25.75	25	22.45	22	25.55	25	28.00	27	13.10	13
Good	61.25	59	58.35	56	57.75	55	57.55	55	72.55	70
Excellent	12.90	12	15.60	14	15.20	15	15.20	15	18.60	17
Total	**104.25**	**100**	**104.25**	**100**	**104.25**	**100**	**104.25**	**100**	**104.25**	**100**

Trend

Down	14.60	14	14.60	14	5.85	6	5.00	5	0.50	0
Static	64.55	62	64.55	62	67.00	64	38.15	37	23.05	22
Up	25.10	24	25.10	24	31.40	30	61.10	58	80.70	78
Total	**104.25**	**100**	**104.25**	**100**	**104.25**	**100**	**104.25**	**100**	**104.25**	**100**

[1] Total Butte Falls and Klamath Resources Areas

Quantitative impact predictions were made by comparing existing fish habitat conditions and improvement potential with grazing systems and forage allocation proposed for each alternative on 20.4 miles of fishery stream identified as having significant problems associated with livestock grazing (see Table 2-5). Predicted habitat trends and conditions under each alternative appear in Appendix G, Table G-2 and are summarized in Table 3-4.

Riparian zone condition and streambank integrity were the two criteria used to determine the extent of livestock influence on stream habitat quality. Streambank erosion caused by or aggravated by livestock was considered "significant" when it amounted to at least 5 percent of streambank length over a stream survey transect, generally one-quarter mile. Riparian zones in fair or poor condition were considered "significantly" impacted by livestock grazing when at least 50 percent of the damage was judged as being related to livestock grazing.

The 88 miles of Class 1 and 2 stream that were identified in Chapter 2 as having negligible livestock grazing impacts are not expected to be appreciably affected by any of the alternatives for the same reasons that they are currently unaffected. In addition better control of livestock distribution in Alternatives 2, 3 and 4 will help ensure that livestock concentrate in riparian zones less than they do at present.

Under Alternative 1 removal and trampling of riparian vegetation and continued accelerated bank erosion would continue for the short and long term on 20.4 miles of stream (see Table 2-5 and Appendix G, Table G-2), where livestock currently adversely affect the quality of fishery habitat to varying degrees. Major stream systems which would be affected under this alternative include Big Butte Creek and tributaries which are important anadromous fish-producing streams and Jenny Creek and tributaries, habitat for the Jenny Creek sucker.

Alternatives 2 and 3 would generally maintain or improve fishery habitat trend and condition on streams that are significantly influenced by livestock grazing. Riparian exclosures that are proposed for portions of 12 streams (see Appendix G, Table G-2) under both alternatives would substantially improve 4.75 miles of habitat. With the exception of Parsnip, Mill and Tyler Creeks, the quality of fishery habitat on other streams with significant livestock-related impacts would stabilize or improve only slightly under the proposed grazing systems and forage allocations. Fishery habitat quality would continue to decline on Parsnip, Mill, and Tyler Creeks where factors other than livestock grazing would cause a further decline in habitat quality.

Table 3-4 Expected Long-Term Condition and Trend of Fishery Habitat (Miles)

	Alt. 1 No Action	Alt. 2 Emphasize Livestock	Alt. 3 Preferred Alternative	Alt. 4 Emphasize Non-Lvst.
Condition				
Excellent	0	0	0	0
Good	16.35	18.65	19.15	23.10
Good to Fair	23.05	21.00	20.75	21.30
Fair	11.95	11.70	11.45	6.95
Poor	0	0	0	0
Total	**51.35**	**51.35**	**51.35**	**51.35**
Trend				
Up	14.70	17.30	26.30	28.45
Static	27.60	31.00	22.00	19.85
Down	9.05	3.05	3.05	3.05
Total	**51.35**	**51.35**	**51.35**	**51.35**

Habitat quality on 20.4 miles of fishery stream is expected to improve under Alternative 4 due to riparian exclosures and elimination of grazing on allotments or pastures that include Class 1 or 2 streams. An upward change in condition class (Appendix G, Table G-2) would be apparent for only 11 stream miles because of other human-related factors that have a greater influence on habitat quality than livestock grazing. For example a downward trend in habitat quality on Fall Creek under a continuation of the existing situation (Alternative 1) would stabilize under Alternative 2 and improve under Alternative 3, but miles of stream in each condition class would not change among alternatives. Water diversions and road erosion would continue to have more of an influence on habitat quality than livestock-related damage to the riparian zone and streambanks under Alternatives 2 and 3. The riparian zone would fully recover only under Alternative 4 and the benefits of this recovery would then override effects of off-site impacts.

Black-tailed and Mule Deer

Future trends of deer ranges were predicted by comparing existing conditions and trends with proposed grazing systems and rangeland improvements.

Under Alternatives 2, 3, and 4, forage for present populations of deer are met with a 5 percent, 10 percent and 30 percent increase in forage for wildlife being proposed in Alternatives 2, 3 and 4, respectively. This could lead to a corresponding potential increase in game populations under Alternatives 3 and 4.

Alternative 1 would cause a slight decline (see Table 3-5) in deer populations for the next 10 to 20 years because it would not check present downward trends on the majority of deer winter ranges. The downward trend and poor condition of the deer winter range is a cumulative effect of past improper grazing practices and control of fire.

Table 3-5 Impacts to Wildlife Populations

Species or Group	Alternative 1 No Action	Alternative 2 Emphasize Livestock	Alternative 3 Preferred Alternative	Alternative 4 Emphasize Non-Livestock
Deer(Black-tailed and Mule)	-L	-L	+L	+M
Elk	-L	-M	+L	+M
Upland Game Birds	NC	-L	+L	+M
Cavity Dependent Species	NC	-M	-L	-L
Other Birds	-L	NC	+L	+M
Small Mammals	-L	NC	NC	+M
Reptiles	-L	NC	NC	+M
Amphibians	-L	NC	+L	+M
Fish	-L	NC	+L	+L

Key:

NC = no change
\+ = beneficial
\- = adverse
L = low
M = medium
H = high

Despite a small amount of additional forage for big game, slight declines in populations would also occur under Alternative 2. Predicted low negative impacts on deer populations under Alternative 2 are due to: (1) the amount of oak-woodland thinning with the ensuing temporary roads would cause loss of cover and increased access (at least temporarily) in the deer winter ranges; (2) loss of structure in some riparian areas would impact key fawning areas; (3) high use by cattle under intensive grazing systems would result in less usable deer habitat; and (4) the amount of the lost acorn mast crop which the deer in the EIS area actively seek in the fall could be significant.

Under Alternative 3, beneficial impacts to deer habitat and hence deer populations include: (1) complete protection of some riparian habitats that are key fawning areas; (2) the development of rest rotation systems that insure non-grazed areas being available; (3) the creation of early seral stage wedgeleaf ceanothus communities (wedgeleaf ceanothus is the most important winter browse species in the EIS area and constitutes over 70 percent of the deer diet in some periods of the winter); (4) retention of hiding cover and mast crops; (5) better distribution of livestock and fewer high livestock use areas; and (6) a significant increase in additional forage both in the short and long term.

All proposed actions under Alternative 4 would be for the benefit of wildlife and wildlife habitat and therefore a moderately beneficial impact is predicted for the deer populations in the EIS area. The reason for a medium versus a high beneficial impact on deer populations (see Table 3-5) is because habitat quality and quantity is not the sole limiting factor. Rural homesite development in critical deer winter range, weather, and predators are some of the other limiting factors, and these factors will not change under any of the alternatives.

Elk

Predicted impacts on elk populations and habitat are very similar to those described under deer. A slightly higher negative impact (see Table 3-5) is predicted under Alternative 2 because elk require more cover than deer, are more intolerant to human disturbance, and compete more directly for forage and space with livestock.

Removal of forage by livestock on elk winter range could be significant if combined with any intensive reforestation efforts (plowing, discing or spraying) in the same area which almost totally removes available forage. When this occurs short and long term impacts would occur. Short term impacts are due to an immediate reduction in available forage. Long term impacts result when plants adjacent to the impacted areas are then grazed beyond the point where they can maintain their vigor for future growth or seedling establishment.

Cavity Dependent Species

Alternatives 2, 3 and 4 would have adverse impacts on this group of species because of the proposal to thin some oak-woodlands (see Appendix D, Standard Design Features). Research conducted on the oak-dominated habitats showed that the highest species numbers and the greatest number of avian individuals occurred in oak-woodlands that contain approximately 45 percent foliar canopy coverage. Below 20 percent foliar canopy, avian species and total individuals dropped off sharply.

Oak-woodland thinning would eliminate some species use and create habitat for other species (i.e., loss of habitat for acorn woodpeckers but create habitat for horned larks). Data generated in Culbertson and Montgomery (1983) shows that converting oak habitats to grasslands impacts 55 terrestrial species, 43 adversely, 12 favorably.

The amount of impacts to cavity-dependent species varies under Alternatives 2, 3, and 4 only by the amount or percentage of the oak-woodlands proposed for rangeland improvement.

Under Alternative 2, 12,577 acres or about 30 percent of the existing oak-woodlands would be treated. Under Alternative 3, about 17 percent would be treated. Under Alternative 4, about 13 percent would be treated. These are the percentages of the total oak-woodlands. In some individual allotments (e.g. 24,31) up to 60 percent may be treated under Alternatives 2 and 3.

Other Mammals, Upland Game Birds, Other Birds, Amphibians, and Reptiles

These animals are grouped to avoid repetition. Impacts are described in general terms. Detailed analysis is not possible because site specific or species specific impacts from existing or proposed livestock management are largely unknown and because their habitat requirements are so diverse. Livestock grazing affects these species primarily through changes in condition of riparian habitat, amount of dried herbaceous vegetation in upland areas (residual ground cover) and plant species composition. Riparian areas in good condition support more kinds and number of wildlife than areas in poor condition (see Riparian Habitat Section). Residual ground cover that persists through winter and spring, which would vary as a result of proposed utilization levels, is very important for nesting, escape from predators, and maintenance

of body temperatures. Long term changes in plant species composition (see Vegetation section) would improve habitat for some species and have adverse impacts on others. See Table 3-5 for summary of impacts to small animal populations.

Livestock exclusion and certain grazing systems that significantly increase woody riparian key species would provide improved winter cover, nesting cover, and food for wildlife. Increased shrub and tree growth in riparian areas would allow birds to nest in previously unoccupied areas. Species such as mountain quail, black-tailed deer, and beaver, which are strongly associated with riparian areas, would be greatly benefited. Studies in Oregon have shown more kinds and total numbers of wildlife in protected riparian habitat as compared to adjacent grazed riparian habitat (Winegar 1977).

Grazing systems that increase upland herbaceous key species composition would improve nesting cover for ground nesters such as blue grouse. Rested pastures in rest rotation systems would have the greatest amount of dried herbaceous vegetation for thermal cover and nesting. Grazing treatments during the following 1 or 2 years after rest would result in decreased cover. Spring/summer grazing would provide the least amount of residual vegetation for wildlife because of the long duration of grazing.

Vegetation manipulation has immediate and often adverse impacts to wildlife populations that inhabit the affected sites because of dramatic changes in plant species composition. Reduction of oak-woodland habitats would affect turkeys and other wildlife dependent on acorn mast crops.

In the short term, burning would moderately reduce some local populations of small animals. Some animals would be killed during the fire; others would be displaced to areas where they could not compete with the existing populations. In the long term, burning would benefit certain wildlife species such as deer, elk, ground squirrels and meadow larks by creating early seral communities.

Proposed spring and pond developments would increase wildlife distribution because ground level water would be available. Occasional drownings of small birds and mammals would occur in troughs despite escape ramps. Increased sources of water provided by new ponds and springs would increase distribution and numbers of species such as the mountain cottontail, Brewer's wren, and mountain quail.

Increases in grasses and other herbaceous species on cut-over forest sites would result in an increase in gopher populations on those sites.

Habitat Diversity

Changes in plant species composition and the amount of structure in the community have been discussed in the above sections as either adverse or beneficial. As plant composition and structure in any given habitat increases there is an increase in diversity which would increase wildlife species and individuals accordingly.

Conclusion

The analysis of impacts to wildlife as summarized in Table 3-5 and Appendix G leads to the following major conclusions:

- Populations of small mammals, birds, and fish dependent on riparian areas would increase as key riparian plant species composition increases. Conversely, a decrease in local populations would be expected as key plant species decrease. Riparian-dependent species would increase most under Alternative 4 and to lesser extent under Alternatives 2 and 3, primarily due to proposed exclusions. These species would decrease under Alternative 1. Under Alternative 2, no appreciable change in these riparian dependent populations would occur over the long term.

- Additional livestock exclusions under Alternatives 3 and 4 would increase upland game bird production.

- Deer and elk populations would slightly decline under Alternatives 1 and 2 and increase under Alternatives 3 and 4.

- Cavity dependent species populations would be reduced or eliminated on 30 percent (Alternative 2), 17 percent (Alternative 3), and 13 percent (Alternative 4) of existing oak-woodlands.

Under Alternative 1, a decrease in residual ground cover in the upland zones would decrease available cover resulting in lessened populations of small animals. Conversely, Alternative 4 would allow increased accumulations of herbaceous litter with resultant increases of small birds, mammals, and reptiles.

Impacts on Wild Horses

Each alternative provides a forage allocation (250 AUMs) for a maximum of 50 horses in the Pokegama Herd Management Area. The development and maintenance of range improvements in allotment 107 under Alternatives 2, 3 and 4 would temporarily disturb the wild horses with increased activity and noise. The five water developments proposed under these alternatives would be available to horses year

long and thus open up areas of forage previously unavailable to horses due to lack of water. The construction of proposed fences could cause injuries to horses until the horses become accustomed to fence locations. No range improvements would be constructed in the herd management area under Alternative 1.

Impacts on Recreation

Under Alternatives 2, 3, and 4, additional fencing would impede access for some recreationists (e.g. Big Butte Creek, Beaverdam Drainage, Anderson Butte Area). The result would be an annoyance to recreationists, causing slight localized reductions or relocations of visitor use for activities such as off-road vehicle use, fishing and hunting. Although fencing would impede access, fishery habitat would improve under Alternatives 3 and 4, resulting in long term improvements in fishing opportunities. Additional water developments under Alternatives 2, 3, and 4 would attract wildlife and enhance localized hunting and sightseeing opportunities. Alternative 1 would result in no impacts because no new range improvements are proposed.

Long-term increases in big game populations under Alternatives 3 and 4 could lead to slight corresponding increases in hunter use.

Projected visitor use to 1990 would not be significantly impacted under any alternative. Localized visitor use reductions would be offset by localized increases in visitor use. Due to increasing recreation demand on public lands, projected use for public lands in the Medford EIS area would increase about 4 percent over existing levels (see Chapter 2) for a total of approximately 1,195,000 visits in 1990. Over the long term, impacts to visitor use would be slightly beneficial under Alternatives 3 and 4 and slightly adverse under Alternatives 1 and 2.

Impacts on Cultural Resources

In accordance with the National Historic Preservation Act of 1966, as amended, Executive Order 11593 and Bureau policy, appropriate measures would be taken to identify and protect cultural sites prior to ground disturbing activities (see Appendix D, Standard Procedures and Design Elements for Range Improvements).

Impacts on Visual Resources

No significant impacts to visual resources would result due to vegetation allocation or grazing systems.

Each type of range improvement was examined to determine the degree of contrast it would create within the typical landscapes of the EIS area. Changes in the characteristic landscape (see Glossary) caused by range improvements vary in their potential to create contrast. Some improvements and vegetation manipulation projects would add visually acceptable variety in an otherwise monotonous landscape. Alternative 2 has the greatest potential to create visual impacts in areas within the foreground of major transportation routes or use areas (e.g. allotments 4, 24, 31, 35, 38, 106, 110, 115, 203, 206, 207, 213). Land ownership patterns, terrain, and small size of land treatments would result in most projects having insignificant visual impacts. Alternative 1 would create no impacts because there would be no new construction of range improvements.

Project design features, as well as VRM program procedures and constraints, would mitigate landform and vegetative contrast under all alternatives (see Appendix D).

Impacts on Special Areas

Under Alternative 4, habitat for sensitive plant species would be enhanced within the Eight Dollar Mountain and Table Rocks potential ACECs. Under Alternatives 1, 2 and 3 there would be no impact in the areas. Grazing under all alternatives would not impact any other identified special area.

Impacts on Wilderness Values

All rangeland management activities in the designated Soda Mountain Wilderness Study Area (see Glossary) would be consistent with the Interim Management Policy and Guidelines for Lands under Wilderness Review (USDI, BLM 1979). Generally, these guidelines state that changes in forage allocation, grazing systems or range improvements may be implemented as long as such changes would not impair the area's wilderness suitability. New permanent range improvements must also enhance wilderness values by better protecting the rangeland in a natural condition.

The Soda Mountain WSA is located in allotment 110. Appendix D, Table D-1 identifies the proposed rangeland improvements in allotment 110 under Alternatives 2, 3, and 4. Improvements that comply with interim management policy guidelines could be constructed prior to a final decision regarding wilderness designation. Improvements (e.g., vegetative manipulations) not in compliance with policy guidelines would be delayed pending a decision regarding the area's wilderness designation and would only be implemented if the area is not designated wilderness. Site specific environmental assessments will identify which improvements have the potential to impair the area's suitability for wilderness designation.

Impacts on Timber Resources

Researchers have historically concluded that use of livestock in forested areas causes extensive damage to timber reproduction (Chapline 1933, Den Uyl 1945, Diller 1935; 1937, Kaufman 1948, Steinbrenner 1951, Trenk 1954). In these early studies, little or no research was done to determine the amount of forage that can be consumed without damage to tree seedlings and/or to relate season of use to timber damage during the growing season. More recent research is not so conclusive, however, reporting mixed results relative to grazing impacts on timber production (Black et al. 1963, Hedrick et al. 1966, Erickson 1974, Windward et al. 1980, Wheeler et al. 1980, Krueger et al. 1980; 1983, Krueger 1983, Leininger et al. 1983).

Other recent studies (Brodie et al. 1979) revealed that animals cause losses of over 60 million dollars in timber productivity each year in Oregon and Washington. Most losses result from damage to planted Douglas-fir and ponderosa pine seedlings during the first 3 to 5 years after reforestation. An extensive survey of BLM-administered lands in western Oregon reported that feeding, trampling and rubbing injuries were the most common type of damage to seedlings (Evans 1981). Animal species thriving on improved habitat and causing the most damage were big game, livestock, rodents, and small mammals. In Josephine and Jackson counties, deer, pocket gophers and cattle were the species that caused the major damage while in Curry, Coos, and Douglas counties deer, elk, and mountain beavers were the major problem species.

The interaction and competition between livestock and wildlife for forage use are also important. Hermann (1965) and Minore (1978) reported a high incidence of seedling mortality from combinations of animal damage and adverse climatic conditions. Evans (1981) reported that the most serious reforestation problems occurred where deer/elk/mountain beaver, and/or deer/cattle/gophers, and/or other such interactions occurred. Consumption of Douglas-fir by deer during the winter has been reported to be inversely related to the amount of other suitable forage available (Roy 1960, Mitchell 1964). Consequently, the allocation of available forage between user groups is important.

The site factors that limit productivity are also important in evaluating grazing impacts. Most of the research dealing with grazing impacts has been conducted in more moderate environments where moisture and temperature extremes are not as great as found in southwest Oregon. For example, in the Wallowa Mountains of northeast Oregon, Krueger (1983) attributed only 8 percent of the total tree seedling losses (about 56 percent mortality) to trampling by livestock, and over half of the seedling mortality to drought. This study also found that 18 percent of total seedling mortality was due to big game and rodent populations. Wheeler (1980) reported similar results with most seedling losses (about 68 percent mortality) caused by drought and rodent activity. Drought is especially important in southwestern Oregon where available moisture is the most limiting factor inhibiting seedling survival and growth. About 64 percent of the Medford District's commercial forest land is classified as Skeletal-xeric and having potential drought problems (de Moulin 1975). For droughty sites, near complete control of competing vegetation is necessary during the first 5 to 7 years of plantation development.

Research by the Forestry Intensified Research Program (FIR) in southwestern Oregon has demonstrated that, on droughty sites, almost complete vegetation control early in the growing season is necessary if target stocking levels are to be achieved on newly established plantations (Hobbs 1982).

Defoliation of ground vegetation by sheep apparently reduced soil moisture withdrawal by deeply-rooted brush species. However, where stimulated by grazing, regrowth by herbaceous plants increased soil moisture losses during the early growing season. Spring-grazed plantations had slightly less or similar soil moisture in the upper two feet of soil, but more soil moisture below two feet than did the control plots in August (Sharrow 1983). Regardless of slight moisture benefits, on southwestern Oregon droughty sites where moisture has been recognized as the critical limiting factor inhibiting reforestation success, seedling mortality has been excessive during the early growing season due to moisture stress. These impacts would be mitigated by deferring reseeding efforts and/or the invasion of residual vegetation for grazing until after successful reforestation.

Under all alternatives, field trials would be undertaken to determine what combination of treatments are possible to make livestock grazing compatible with timber production on moisture limiting sites. Proper livestock grazing itself is not the major cause for seedling mortality; rather, seedling mortality is attributed to moisture stress and damage from rodents associated with lush, improved vegetative growth.

Studies that reported significant increases in seedling height and diameter growth when competing vegetation was grazed by livestock, emphasized proper stocking rates, dispersal, forage utilization, and proper season of grazing as key elements of success (Hall 1959, Leininger 1983, Wheeler et al. 1980, Krueger 1983). Spring grazing (before July 15) resulted in significant damage to seedlings in most studies. In most cases, grazing during the summer and fall caused insignificant seedling damage. Heavy utilization of forage by livestock during the summer and fall seasons increased wildlife damage to seedlings during the winter and spring months. Seedling mortality and damage resulting from grazing pressure became severe when forage utilization exceeded 35 to 50 percent for sheep (Hedrick et al. 1966, Sharrow et al. 1983) and 80 percent for cattle (Wheeler et al. 1980).

Significant increases in forage availability can be achieved by seeding high yielding, palatable forage species subsequent to timber harvest (Vavra et al. 1980). Grass species can also retard the successional development of residual shrubs and less palatable herbaceous species (Krueger et al. 1980). This could result in more complete vegetation utilization by livestock and thus increase soil moisture reserves. Although more forage is available on areas seeded with grass, two studies reported no significant difference in tree seedling survival and height growth between grazed seeded and unseeded areas (Krueger 1983, Krueger et al. 1983). It is obvious that on certain sites, properly managed livestock grazing does not conflict with timber management. The following is a discussion of specific impacts of proposed Alternatives 1-4.

Under all alternatives, on droughty sites where moisture is a critical limiting factor and/or where resident gopher populations exist (estimated to be 65 percent of the EIS area), seedling mortality is expected to be 40 to 60 percent due to the effects of competing vegetation. Of this mortality, approximately 70 percent would be due to drought; 20 percent due to big game and rodents; and 10 percent due to livestock. These losses would be mitigated by the near complete chemical and/or manual control of competing vegetation during the first 5 to 7 years of plantation establishment.

On moderate sites where moisture is not limiting and/or where resident gopher populations do not exist (about 35 percent of the EIS area), seedling mortality is expected to be 10 to 20 percent. Of this mortality, approximately 70 percent would be due to drought, poor planting, etc.; 20 percent due to big game and rodents; and 10 percent due to livestock. Alternative 4 would slightly increase overall conifer survival (about 2 percent) on lands withdrawn from livestock grazing. The above survival projections are based on little or no grazing during the winter and spring months, and 60 percent and 35 percent utilization of palatable forage by cattle and sheep respectively.

Under all alternatives, where proper grazing is accomplished, increased height and diameter growth of seedlings may occur, improving potential yields. Alternatives 2 and 3 would facilitate better livestock dispersal and more forage utilization, thus possibly increasing seedling survival and growth.

Under all alternatives (to a lesser degree for Alternative 4), on those units where grazing interaction occurs between species (wild horses, deer, livestock, etc.) decreased seedling survival and growth can be expected. However, when proper allocation of forage between user groups is achieved, seedling mortality due to animal grazing is expected to be less than 30 percent of total mortality. In certain areas where heavy deer use exists, the use of tree seedling protection devices (bud caps, tubing) may be necessary to keep deer damage at acceptable levels.

Conclusion

Under all alternatives, with cooperative livestock operators; proper season of use; proper stocking levels and distribution of animals; and proper allocation of forage between user groups, seeding and livestock grazing on moderate sites would not conflict with forestry objectives.

Impacts on Human Health

Exposure to herbicides used in range management is most likely to occur to handlers, applicators, crew supervisors and observers at or adjacent to spray units. Mixer/loaders have been found to receive the greatest exposure due to handling of concentrated chemicals (Lavy et al. 1980).

The probability of the general public being exposed to herbicides used on rangeland would be very low. This is due in large part to remoteness of location from population centers and human use.

The laboratory dosages at which potential reproductive effects have been detected, or at which carcinogenic and mutagenic effects have been tested for and not found, are much greater in concentration and duration than any exposure that would occur in the field as a result of vegetation management. Because of the limited toxicity of the herbicide proposed for use and the low potential for exposure, the likelihood of an adverse impact on human health is negligible.

Impacts on Socioeconomic Conditions

The economic impacts are expressed in terms of the effects on dependence on public forage, on ranch property values, and on local income and employment from grazing activity and from the construction of range improvements. The impacts are valued in 1982 dollars. Impacts on hunting and fishing activity are not significant in terms of local income and employment. Social impacts not primarily economic in nature are discussed as appropriate.

Effect On Dependence On Public Forage

In determining the effect on dependence, active (paid) use in 1982 was subtracted from future long-term allocations in each allotment. (Short-term allocations were disregarded as virtually the same as the long-term allocations.) For analysis purposes, the allocations were divided among the lessees in proportion to 1982 active preference.

Table 3-6 shows how annual forage requirements of individual lessees would be affected by the alternatives. Losses experienced by individual lessees would be less than 10 percent of their forage needs except under Alternative 4 where two lessees would lose more than 10 percent of their annual requirements. The average change in forage as a percent of annual requirements is also shown in the table. The seasonal distribution of public forage use is not expected to change significantly from current patterns.

Effect On Ranch Property Values

The effect on ranch values as collateral for loans or in the sale of the enterprise has been calculated by valuing public forage licenses at $45 per AUM. The effect on ranch value is related to the change in licensed forage from the existing (1982) active preference level rather than from the existing use level. As shown in Table 3-7, a loss of more than $10,000 in ranch value would be experienced by one lessee under Alternative 1, and by 7 lessees under Alternative 4. The total loss on the part of lessees experiencing losses, the total gain for those gaining and the net change in ranch values is also shown in the table.

Effects On Local Income And Employment

The effects of the alternatives on local personal income and employment resulting from changes in forage are shown in Table 3-8. These effects were estimated on the assumption that livestock sales would vary in direct proportion to forage availability. They would differ if lessees were unable to utilize public forage when it was available.

Within the local livestock industry, personal income and employment would be increased under all alternatives except Alternative 4 which would have a small reduction in income. The local economy of Jackson and Klamath Counties would also experience gains in income and employment under Alternatives 1, 2 or 3, but losses under Alternative 4.

Table 3-6 Number of Lessees By Size Of Long-term Change In Public Forage

Change in Forage as Percent of annual Requirements	Alt. 1	Alt. 2	Alt. 3	Alt. 4
Loss over -10.0%	-	-	-	2
-0.1 to -9.9%	17	5	6	22
No change	64	59	63	65
+0.1 to 9.9%	20	21	20	12
+10.0 to 19.9%	1	10	7	2
+20.0 to 29.9%	2	-	4	1
+30.0 to 49.9%	-	5	3	-
+50.0% or more	1	5	2	1
Average change	**+1.8%**	**+9.1%**	**+4.8%**	**-0.6%**

Range improvements to be made under each of the alternatives except Alternative 1, would generate temporary increases in local income and employment during the period of their construction. These effects would be distributed over the construction period and would not be sustained afterward. The total effects are shown in Table 3-9.

Table 3-7 Number of Lessees by Size of Long-term Change in Ranch Value (Based on active preference valued at $45 per AUM)

Change in Ranch Value	Alt. 1	Alt. 2	Alt. 3	Alt. 4
Gain over $20,000	-	14	5	1
+$10,000 to $19,900	-	10	10	1
+$1,000 to $9,900	-	10	13	2
Change less than ± $1,000	102	71	76	78
-$1,000 to -$9,900	2	-	-	16
Loss over -$10,000	1	-	-	7
Total loss	-$18,990	-$ 180	-$ 450	-$373,950
Total gain	-	+ 757,440	+ 362,385	+ 91,890
Net change [1]	-$18,990	+$757,260	+$361,935	-$282,060

[1] Omits unassigned grazing preference.

Table 3-8 Effects on Local Personal Income and Employment Due to Long-term Changes in Public Forage [1]

	Livestock Industry		EIS Area [2]	
Action	Personal Income	Employment	Personal Income	Employment
Alternative 1	+$ 21,000	+1	+$ 97,000	+ 3
Alternative 2	+ 105,000	+3	+ 488,000	+14
Alternative 3	+ 57,000	+2	+ 266,000	+ 8
Alternative 4	- 6,000	-	- 30,000	- 1

[1] Estimates based on forage change from 1982 active use level. Effects estimated by factors derived from interindustry model as shown in Appendix H.
[2] Jackson and Klamath Counties.

Table 3-9 Short-term Effects on Local Income and Employment Due to Range Improvements [1] (Total effects over entire construction period.)

Action	Construction Costs Of Improvements	Personal Income	Employment [2]
Alternative 2	$1,803,300	$1,401,000	47
Alternative 3	$1,004,500	$ 780,400	26
Alternative 4	$1,289,100	$1,001,500	34

[1] Effects estimated by factors derived from interindustry model as shown in Appendix H.
[2] Approximates job-years. Were construction to occur over a 5-year period, the number of workers employed during the period would average one-fifth of the amount shown.

List of Agencies, Organizations and Persons to Whom Copies of the Statement are Sent (in addition to approximately 250 individuals and other organizations):

Federal Agencies

Advisory Council on Historic Preservation
Department of Agriculture
  Forest Service
  Soil Conservation Service
Department of Defense
  U.S. Army Corps of Engineers
Department of the Interior
  Fish and Wildlife Service
  Geological Survey
  National Park Service
  Bureau of Mines
  Bureau of Reclamation
Environmental Protection Agency

State and Local Government

Coos, Curry, Douglas, Jackson, Josephine and Klamath County Planning Commissions
Oregon State Clearinghouse
Oregon State Historic Preservation Officer

Interest Groups

All Grazing Lessees in the Medford EIS Area
American Fisheries Society
American Horse Protection Association
Audobon Society
Natural Resources Defense Council Izaak Walton League
Jackson County Cattlemen's Association
National Wildlife Federation
Nature Conservancy
Oregon Cattlemen's Association
Oregon Environmental Council
Oregon Natural Heritage Program
Oregon Natural Resources Council
Oregon State University, Dept. of Range Management
Oregon Sheepgrowers
Public Lands Council
Sierra Club
Society for Range Management
Southern Oregon Resource Alliance (SORA)
Threatened and Endangered Little Applegate Valley (TELAV)
Wilderness Society
Wild Horse Organized Assistance
Wildlife Management Institute
Wildlife Society, Oregon Chapter
Approximately 250 other individuals and organizations.

Copies of this draft environmental impact statement will be available for public inspection at the following BLM offices:

Washington Office of Public Affairs
18th and C Streets
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Reading copies will be placed in the following libraries: Portland State University, Portland; Oregon State University, Corvallis; University of Oregon, Eugene; Southern Oregon State College, Ashland; Oregon Institute of Technology, Klamath Falls; Rogue Community College, Grants Pass; and the Coos, Curry, Douglas, Jackson, Josephine and Klamath County libraries.

LIST OF PREPARERS

While individuals have primary responsibility for preparing sections of an EIS, the document is an interdisciplinary team effort. In addition, internal review of the document occurs throughout preparation. Specialists at the District and State Office levels of the Bureau both review the analysis and supply information. Contributions by individual preparers may be subject to revision by other BLM specialists and by management during the internal review process.

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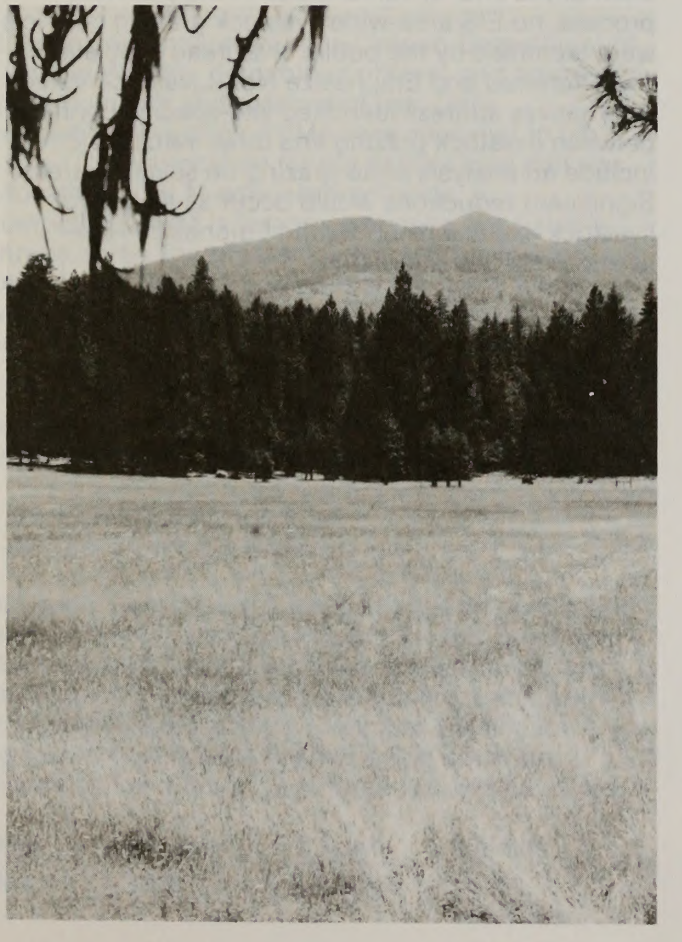
Appendices



A. Summary and Results of EIS Scoping.

B. Determination of Forage Production and Vegetation Allocations, Table B-1, Initial and Long-Term Vegetation Allocations.

C. Pasture - Specific Data.
Table C-1, Existing Condition, Proposed Grazing Systems, Predicted Long-Term Condition and Trend and Periods of Use.

D. Standard Procedures and Design Elements for the Construction of Range Improvements.
Table D-1, Proposed Range Improvements by Allotment.

E. Determination of Existing and Predicted Range Condition and Trend.

F. Scientific Names of Plants Mentioned in the EIS.

G. Riparian and Stream Habitat Inventory Methodologies.
Table G-1, Streamside Riparian Habitat - Predicted Condition and Trend.
Table G-2, Fishery Habitat - Predicted Condition and Trend.

H. Estimates of Gross Sales, Personal Income and Employment.
Table H-1, Economic Effects per Unit Measure.
Table H-2, Value of Cattle and Calves Sold per AUM.

Appendix A

Summary and Results of EIS Scoping

A public meeting for scoping the Medford Grazing Management Environmental Impact Statement (EIS) was combined with a meeting to discuss the development of the preferred alternative for the Josephine and Jackson-Klamath Management Framework Plan (MFP) amendments. At that stage, four land use allocation alternatives had been developed from criteria established with earlier public input. The four alternatives called for various allocations of forage, different amounts of protection for riparian areas, and various proposals for range investments.

The MFP Alternatives were discussed in a public meeting in Medford, Oregon, on April 19, 1983.

Oral and written comments were used in developing the alternatives to be analyzed in the Medford Grazing EIS. These comments led to the development of four alternatives:

- Alternative 1, No Action (continue existing level of livestock grazing). This alternative is required by law.

- Alternative 2, Emphasize Livestock Grazing.

- Alternative 3, Preferred Alternative.

- Alternative 4, Emphasize Non-Livestock Grazing Values.

The preferred alternative contains elements adopted primarily from MFP Alternatives B and C as modified by a preliminary benefit-cost analysis and public comments.

The emphasize livestock grazing alternative consists primarily of elements of MFP Alternatives A and B. Under this alternative, much support was noted for increased forage production as well as for riparian zone and water quality protection.

The emphasize non-livestock values alternative would exclude livestock grazing in Class 1 and 2 riparian zones and semi-wet meadows. Within Class 3 to 5 riparian zones, livestock use would be excluded on summer range in allotments where Class 1 and 2 conflicts with livestock have been identified. Two potential Areas of Critical Environmental Concern (ACECs) would be excluded from grazing under this alternative.

Comments received during scoping focused on several issues: riparian area management, wildlife habitat diversity, forage allocation, range investments, intermingled land, threatened and endangered and sensitive plant species, and economic costs and benefits.

As wild horses were not identified as an issue, all EIS alternatives call for the management of the wild horse herd population under the existing wild horse herd management plan. Public comment generally opposed increasing wild horses in any alternative.

Comments were received which suggested the following as elements of alternatives to be analyzed in the EIS: no chemical use, and seeding grass in cut-over timberlands. No herbicides would be used for the benefit of livestock grazing under the Emphasize Non-livestock Values Alternative. The Emphasize Livestock, Preferred and Emphasize Non-livestock Values Alternatives have incorporated varying degrees of seeding on cut-over lands. Seeding in forested areas would be coordinated with timber management objectives.

Public comment supported analysis in the EIS of either a "reduced grazing" or "no grazing" alternative. The No Grazing Alternative was eliminated from detailed study because it has entirely different goals from any of the land use alternatives and, at earlier steps in the planning process, no EIS area-wide livestock grazing conflicts were identified by the public or Bureau specialists. The Preferred and Emphasize Non-Livestock Values Alternatives address identified site-specific conflicts between livestock grazing and other values and include an analysis of no grazing on selected areas. Significant reductions would occur as a result of livestock exclusions under the Emphasize Non-livestock Values Alternative.

Appendix B

Determination of Present Forage Production

Forage production for the EIS area was determined by using the Soil Conservation Service Range and Forest Site guides, stocking rates and recent range survey. In addition, this information was compared with allotment actual use data and estimated ecological and forage condition with recent levels of use by cattle, horses, and wildlife.

Determination of Short Term Allocation

The existing livestock forage production is proposed for allocation among livestock, wildlife, wild horses and nonconsumptive uses. Proposed allocations were designed to be consistent with the goals and objectives of each of the alternatives. Short term allocation indicates AUMs which would be credited during period of implementation. These allocations would be made within 1 to 2 years following the development of range improvements and implementation of systems.

Wild horse forage allocations are based on population objectives set forth in the existing wild horse herd management plan.

BLM, in conjunction with the Oregon Department of Fish and Wildlife, determined present and future big game numbers and seasons of use. Only competitive livestock AUMs were allocated to big game. Thus, allocation for big game's total diet was allocated for BLM-administered lands. A competitive AUM is forage composed of palatable shrubs, forbs and grasses eaten by both livestock and wildlife. The portion of total big game forage which is competitive is based on the dietary overlap or percentage of competition by deer or elk.

Big game unit months were converted to AUMs using the following conversion rates:

6 Deer Unit Months = 1 AUM
3 Elk Unit Month = 1 AUM

Big game was allocated forage based on public land in the allotment and the area of use. Big game herd size was based on pellet group studies conducted on range and forest sites and then correlated with the Oregon Department of Fish and Wildlife for comparison of data. A mathematical equation illustrates the method used to derive wildlife AUMs:

$$\text{Deer Nos.} \times \text{Months Use} \times \frac{\text{1 AUM}}{\text{6.0 Deer}} = \text{Wildlife AUM Allocation}$$

The same formula with the 3:1 AUM conversion factor was used for elk.

Determination of Future Forage Production

The analysis of predicted changes in grazing capacity is based on the expected change in key species composition and vegetative production. These changes would occur as a result of changes in livestock distribution, season of use, fencing, timing and intensity of livestock grazing, and the partial conversion of shrub and oak woodland communities to perennial grasses and shrubs; oak trees and grasses.

In Allotment 001 for example, the implementation of a deferred rotation grazing system on approximately 9,630 acres, the construction of 16 miles of fence, and the development of 3 springs would result in improved livestock distribution and periodic rest for key forage species. Brush control on 173 acres and oak thinning and removal on 1,575 acres, plus seeding on 1,905 acres, is predicted to increase short term livestock and wildlife forage production by 876 AUMs. An additional 165 AUMs of long term forage production is also expected.

Fifteen years following implementation, the forage production of the allotment is thus expected to increase by an estimated 1,041 AUMs. Added to the current production of 4,261 AUMs, the future forage production of the allotment would be approximately 5,302 AUMs.

Determination of Long-Term Allocations

The long-term allocation is for analysis purposes only. The actual allocation would occur only after evaluation determines that the forage is available and would depend upon the multiple use objectives of future resource management plans.

Appendix B, Table B-1 Vegetation Allocations (AUMs) [1]

Allotment Number	Allotment Name	Federal Acres	Alternative 1 - No Action					Alternative 2 - Emphasize Livestock					Alternative 3 - Preferred					Alternative 4 - Emphasize Non-livestock				
			STLV	LTLV	STWL	LTWL	NC	STLV	LTLV	STWL	LTWL	NC	STLV	LTLV	STWL	LTWL	NC	STLV	LTLV	STWL	LTWL	NC
001	Lost Creek	9,630	350	333	2,103	1,998	1,808	1,550	1,627	2,103	2,208	1,808	1,032	1,083	2,297	2,411	1,808	223	223	2,669	2,802	1,935
002	Flat Creek	14,250	308	308	2,279	2,279	1,725	308	308	2,279	2,279	1,725	308	308	2,279	2,279	1,725	308	308	2,279	2,279	1,725
003	Trail Creek	12,868	113	113	734	734	950	113	113	734	734	950	113	113	734	734	950	113	113	734	734	950
004	Long Branch	11,164	93	93	2,159	2,139	2,210	212	223	2,159	2,159	2,210	93	93	2,159	2,159	2,210	93	93	2,696	2,830	2,210
005	Antioch Road	40	4	4	5	5	10	4	4	5	5	10	4	4	5	5	10	4	4	5	5	10
006	Round Top Evans	27,086	110	110	3,019	3,019	2,709	110	110	3,019	3,019	2,709	110	110	3,019	3,019	2,709	110	110	3,019	3,019	2,709
007	Straus Ranch	1,719	90	90	248	248	408	90	90	248	248	408	90	90	248	248	408	90	90	1,034	1,085	408
008	Neil-Tarbell	529	56	56	46	46	93	56	56	46	46	93	56	56	46	46	93	56	56	46	46	93
009	N. Sams Valley	120	8	8	17	17	28	8	8	17	17	28	8	8	17	17	28	8	8	17	17	28
010	W. Perry Rd.-inactive	75																				
011	E. Perry Rd.-inactive	40																				
012	Upper Table Rock	560	65	65	82	82	132	65	65	82	82	132	65	65	82	82	132	0	0	82	82	132
013	Clear Creek	1,757	45	45	310	310	350	45	45	310	310	350	45	45	310	310	350	45	45	310	310	350
014	Obenchain	120	12	12	5	5	29	12	12	5	5	29	12	12	5	5	29	12	12	5	5	29
016	Brownsboro Park	321	45	45	47	47	66	45	45	47	47	66	45	45	47	47	66	45	45	47	47	66
017	Kanutchen Field	2,148	177	167	264	255	460	383	402	264	277	460	177	177	264	277	460	177	177	397	416	460
018	Nichols Gap	280	18	18	40	40	66	18	18	40	40	66	18	18	40	40	66	18	18	40	40	66
019	Sugar Loaf	1,340	15	15	206	206	522	15	15	206	206	522	15	15	206	206	522	15	15	206	206	522
020	Engle Pt. Coral	465	8	8	35	35	90	8	8	35	35	90	8	8	35	35	90	8	8	35	35	90
021	Section 9	343	25	25	64	64	99	25	25	64	64	99	25	25	64	64	99	25	25	64	64	99
022	Section 7	378	11	11	28	28	68	11	11	28	28	68	11	11	28	28	68	11	11	28	28	68
023	Bull Run	40	5	5	4	4	8	5	5	4	4	8	5	5	4	4	8	5	5	4	4	8
024	Big Butte	20,174	1,663	1,580	3,054	2,901	3,803	3,649	3,649	3,054	3,054	3,803	3,366	3,366	3,665	3,665	3,803	906	906	4,728	4,728	3,803
025	Shady Branch	320	32	32	37	37	81	32	32	37	37	81	32	32	37	37	81	32	32	37	37	81
026	TouVelle	30	20	20	3	3	8	20	20	3	3	8	20	20	3	3	8	20	20	3	3	8
027	Reese Creek	40	7	7	5	5	10	7	7	5	5	10	7	7	5	5	10	7	7	5	5	10
029	Derby Rd. Sawmill	521	45	45	63	63	105	45	45	63	63	105	45	45	63	63	105	45	45	63	63	105
030	Derby Station	540	36	36	51	51	90	36	36	51	51	90	36	36	51	51	90	36	36	51	51	90
031	Summit Prairie	25,734	1,136	1,079	3,808	3,618	4,210	3,682	3,682	3,808	3,808	4,210	2,942	2,942	4,388	4,388	4,210	136	136	4,280	4,280	5,210
032	Patco Ranch	680	38	38	114	114	146	38	38	114	114	146	38	38	114	114	146	38	38	114	114	146
033	Lick Creek 80	80	24	24	11	11	19	24	24	11	11	19	24	24	11	11	19	24	24	11	11	19
034	West Derby	440	45	45	36	36	106	45	45	36	36	106	45	45	36	36	106	45	45	36	36	106
035	Vestal Butte	1,715	120	114	163	155	282	260	273	163	163	282	120	120	163	163	282	120	120	368	368	282
038	Crowfoot	8,056	365	329	901	811	1,397	2,072	2,170	901	946	1,397	792	792	1,848	1,848	1,397	375	375	2,901	3,046	1,397
039	Crowfoot Creek	576	69	69	37	37	89	69	69	37	37	89	69	69	37	37	89	69	69	37	37	89
040	Cobleigh Rd. 80	80	7	7	11	11	19	7	7	11	11	19	7	7	11	11	19	7	7	11	11	19
041	Moser Mountain	40	3	3	3	3	10	3	3	3	3	10	3	3	3	3	10	3	3	3	3	10
043	Devon South	465	33	33	52	52	94	33	33	52	52	94	33	33	52	52	94	33	33	52	52	94
044	Salt Creek 2	80	15	15	7	7	15	15	15	7	7	15	15	15	7	7	15	15	15	7	7	15
045	Salt Creek 3	200	40	40	25	25	45	40	40	25	25	45	40	40	25	25	45	40	40	25	25	45
046	Salt Creek 1	280	30	30	8	8	42	30	30	8	8	42	30	30	8	8	42	30	30	8	8	42
101	Chase Mountain	8,823	195	195	1,681	1,681	1,941	195	195	1,681	1,681	1,941	195	195	1,681	1,681	1,941	195	195	1,681	1,681	1,941
102	Edge Creek	8,860	355	355	1,781	1,781	1,793	355	355	1,781	1,781	1,793	355	355	1,781	1,781	1,793	355	355	2,926	1,984	1,793
103	Buck Mountain	9,215	204	204	1,643	1,643	1,539	204	204	1,643	1,643	1,539	204	204	1,643	1,643	1,539	204	204	1,643	1,643	1,539
104	Buck Lake	11,971	280	280	2,129	2,129	2,286	280	280	2,129	2,129	2,286	452	452	2,129	2,129	2,286	280	280	2,129	2,129	2,286
105	Johnson Prairie	120	12	12	?	?	?	12	12	?	?	?	12	12	?	?	?	12	12	?	?	?
106	Deadwood	8,301	1,032	1,032	1,489	1,489	1,683	1,884	1,921	1,583	1,614	1,683	1,776	1,811	1,673	1,706	1,683	1,776	1,811	1,673	1,706	1,683
107	Dixie	4,800	415	394	394	394	944	1,316	1,120	894	938	944	774	812	1,028	1,079	944	415	415	1,178	1,236	944
108	Jenny Creek	1,316	120	120	120	120	244	120	120	120	120	244	120	120	120	120	244	120	120	120	120	244
109	Agate	107	9	9	10	10	22	9	9	10	10	22	9	9	10	10	22	9	9	10	10	22
110	Soda Mountain	33,888	4,011	4,011	5,907	5,907	5,745	6,348	6,474	7,517	7,667	5,745	4,775	4,870	7,560	7,711	5,745	1,512	1,512	8,913	8,913	5,745
111	Emigrant Creek	40	7	7	3	3	8	7	7	3	3	8	7	7	3	3	8	7	7	3	3	8
112	Cove Creek	1,160	75	75	3	3	52	75	75	3	3	52	75	75	3	3	52	75	75	3	3	52
113	Poole Hill	1,760	27	27	230	230	225	27	27	230	230	225	27	27	230	230	225	27	27	230	230	225
114	Buck Point	920	150	150	?	?	?	150	150	?	?	?	150	150	?	?	?	150	150	?	?	?
115	Keene Creek	25,402	3,736	3,736	4,454	4,454	4,783	3,800	3,990	4,518	4,740	4,783	3,607	3,787	4,518	4,740	4,783	0	0	7,175	7,175	4,783
116	Howard Prairie	320	60	60	15	15	30	60	60	15	15	30	60	60	15	15	30	60	60	15	15	30
117	Conde Creek	4,786	592	592	603	858	986	1,152	1,175	920	938	986	889	906	1,155	1,176	986	850	850	1,194	1,217	986
118	Siskiyou	1,815	200	200	305	305	340	200	200	305	305	340	200	200	305	305	340	200	200	305	305	340
119	Grizzly	5,527	378	378	1,204	1,204	940	935	953	1,266	1,291	940	378	378	1,204	1,204	940	150	150	1,372	1,372	1,000
120	Baldy	1,044	115	115	128	128	160	115	115	128	128	160	115	115	128	128	160	115	115	128	128	160
121	Cascade Ranch	4,309	478	478	481	481	807	744	781	746	783	807	478	478	481	481	807	538	564	720	783	807
122	Lake Cr. Summer	4,871	550	550	502	502	520	550	550	502	502	520	550	550	502	502	520	550	550	502	502	520
123	Lost Creek	80	6	6	6	6	38	6	6	6	6	38	6	6	6	6	38	6	6	6	6	38

124	Deer Creek	4,025	368	368	549	549	560	368	368	549	549	560	368	368	549	549	560	368	368	549	549	560
125	South Heppsie	796	36	36	112	112	135	36	36	112	112	135	36	36	112	112	135	36	36	112	112	135
126	Heppsie Mtn.	3,276	294	294	461	461	454	294	294	461	461	454	294	294	461	461	454	294	294	461	461	454
127	Cartwright	40	4	4	2	3	4	4	4	2	3	4	4	4	2	3	4	4	4	2	3	4
129	Hungerflat	1,839	220	220	175	175	236	220	220	175	175	236	220	220	175	175	236	220	220	175	175	236
132	Antelope Road	400	30	30	42	42	72	30	30	42	42	72	30	30	42	42	72	30	30	42	42	72
133	Brownsboro	160	15	15	10	8	10	15	15	10	8	10	15	15	10	8	10	15	15	10	8	10
134	Yankee Reservoir	200	24	24	28	28	62	24	24	28	28	62	24	24	28	28	62	24	24	28	28	62
136	Canal	440	58	58	37	37	83	58	58	37	37	83	58	58	37	37	83	58	58	37	37	83
137	Box R Ranch	80	5	5	20	18	11	5	5	20	18	11	5	5	20	18	11	5	5	20	18	11
139	I-5	173	21	21	?	?	?	21	21	?	?	?	21	21	?	?	?	21	21	?	?	?
140	Dry Lake	145	10	10	15	15	29	10	10	15	15	29	10	10	15	15	29	10	10	15	15	29
141	Chicken Hills	3,618	80	80	931	931	827	80	80	931	931	827	80	80	931	931	827	80	80	931	931	827
142	Long Lake	363	18	18	?	?	?	18	18	?	?	?	18	18	?	?	?	18	18	?	?	?
143	Cove Ranch	160	20	20	?	?	?	20	20	?	?	?	20	20	?	?	?	20	20	?	?	?
144	Bybee Peak	321	36	36	32	32	44	36	36	32	32	44	36	36	32	32	44	36	36	32	32	44
145	Box D Ranch	200	10	10	?	?	?	10	10	?	?	?	10	10	?	?	?	10	10	?	?	?
147	Grubb Springs	1,884	130	130	650	650	605	130	130	650	650	605	130	130	650	650	605	130	130	650	650	605
148	North Cove Creek	281	20	20	?	?	?	20	20	?	?	?	20	20	?	?	?	20	20	?	?	?
202	Tunnel Ridge	2,200	14	14	?	?	?	14	14	?	?	?	14	14	?	?	?	14	14	?	?	?
203	Billy & Sugarloaf Mtn	7,684	534	534	801	801	890	1,634	1,661	801	817	890	930	948	1,065	1,086	890	534	534	1,461	1,490	890
204	Timber Mtn.	1,720	70	70	?	?	?	70	70	?	?	?	70	70	?	?	?	70	70	?	?	?
206	Lower Big Applegate	37,270	930	930	2,790	2,790	2,481	2,688	2,741	2,790	2,845	2,481	1,485	1,514	3,139	3,201	2,481	930	930	4,138	4,220	2,481
207	Sterling Creek	29,219	478	478	2,915	2,915	2,263	2,823	2,823	3,069	3,069	2,263	478	478	2,915	2,915	2,263	1,023	1,023	4,149	4,231	2,263
208	Spencer Gulch	1,935	150	150	?	?	?	150	150	?	?	?	150	150	?	?	?	150	150	?	?	?
209	Quartz Gulch-inactive	641																				
210	Stiehl	175	18	18	?	?	?	18	18	?	?	?	18	18	?	?	?	18	18	?	?	?
211	Fielder Creek	40	5	5	?	?	?	5	5	?	?	?	5	5	?	?	?	5	5	?	?	?
213	Chapman Creek	3,309	81	81	425	433	337	81	81	425	433	337	81	81	425	433	337	81	81	425	433	337
216	Del Rio	40	5	5	?	?	?	5	5	?	?	?	5	5	?	?	?	5	5	?	?	?
217	Ecker	40	6	6	?	?	?	6	6	?	?	?	6	6	?	?	?	6	6	?	?	?
218	Stage Road	40	4	4	?	?	?	4	4	?	?	?	4	4	?	?	?	4	4	?	?	?
219	Foots Creek	116	12	12	?	?	?	12	12	?	?	?	12	12	?	?	?	12	12	?	?	?
221	Rock Gulch-inactive	520																				
222	Lomas Road	60	20	20	?	?	?	20	20	?	?	?	20	20	?	?	?	20	20	?	?	?
223	Star	118	24	24	?	?	?	24	20	?	?	?	24	24	?	?	?	24	24	?	?	?
302	Pickett Mtn.	820	80	80	?	?	?	80	80	?	?	?	80	80	?	?	?	80	80	?	?	?
303	Jump Off Joe	40	8	8	?	?	?	8	8	?	?	?	8	8	?	?	?	8	8	?	?	?
308	Deer Creek	1,165	77	77	?	?	?	77	77	?	?	?	77	77	?	?	?	22	22	?	?	?
309	Reeves Creek	1,672	95	95	?	?	?	95	95	?	?	?	95	95	?	?	?	95	95	?	?	?
310	O Bar X	15	3	3	?	?	?	3	3	?	?	?	3	3	?	?	?	3	3	?	?	?
312	Esterly Lake	4,457	152	152	?	?	?	152	152	?	?	?	152	152	?	?	?	152	152	?	?	?
315	Glade Creek	560	17	17	?	?	?	17	17	?	?	?	17	17	?	?	?	17	17	?	?	?
316	Cherry Gulch	40	6	6	?	?	?	6	6	?	?	?	6	6	?	?	?	6	6	?	?	?
		397,056	**22,496**	**22,266**	**53,182**	**52,867**	**56,615**	**41,140**	**41,669**	**56,248**	**57,014**	**56,615**	**30,272**	**30,735**	**59,214**	**59,907**	**56,615**	**15,646**	**15,707**	**71,635**	**71,550**	**57,802**

[1] Short term allocation indicates AUMs which would be credited during the implementation period. Long term allocations show an assumption as to how AUMs would be allocated during the 15-year period following implementation. Short and long term allocations are the same within each alternative for wild horses and nonconsumptive uses. Under all alternatives, 250 AUMs would be allocated to wild horses in allotment 102, Edge Creek and allotment 107, Dixie.

Key:

STLV - Short Term Livestock
LTLV - Long Term Livestock
STWL - Short Term Wildlife
LTWL - Long Term Wildlife
NC - Nonconsumptive
? - No data

Appendix C, Table C-1 Pasture Specific Data
Existing Condition, Proposed Grazing Systems, Predicted Long-Term Condition and Trend and Periods of Use

Allot-ment Number	Allotment Name	Pasture No. and Name	Forested Sites Existing Forage Condition G,F,P or ?	Non-Forested Hardwoods Existing Ecological Condition L, M, E or ?	Alternative 1			Alternative 2			Alternative 3			Alternative 4			Max. Periods of Use	
					Grazing System	Condition	Trend	Grazing System	Condition	Trend	Grazing System	Condition	Trend	Grazing System	Condition	Trend	Existing Month/day	Proposed Month/day[1]
001	Lost Creek	1	F	E	SS	F,E	D	RR2	F,M	U	DR	F,M	U	DR	F,M	U	04/20-10/31	05/01-05/30
		2	F	E	SS	F,E	D	RR2	F,M	U	DR	F,M	U	DR	F,M	U	04/20-10/31	05/01-05/30
		3	F	E	SS	F,E	D	DR	F,M	U	DR	F,M	U	DR	F,M	U	04/20-10/31	06/01-10/31
002	Flat Creek		P	E	SS	P,E	S	DR	F,E	S	DR	F,E	S	SP	F,E	S	05/01-10/15	05/01-10/15
003	Trail Creek		?	?	SS	?	?	SS	?	?	SS	?	?	SS	?	?	04/16-11/30	05/01-11/30
004	Longbranch		P	E	SS	P,E	S	DR	F,E	S	DR	F,E	S	DR	F,E	S	04/16-07/15	05/01-07/15
005	Antioch Rd.		?	?	SU	?	?	SU	?	?	SU	?	?	SU	?	?	06/01-07/31	06/01-07/31
006	Roundtop-Evans		?	?	SS	?	?	SS	?	?	SS	?	?	SS	?	?	05/01-10/15	05/01-10/15
007	Straus Ranch		?	?	DR	?	?	DR	?	?	DR	?	?	DR	?	?	04/01-06/30	04/15-06/30
008	Neil-Tarbell		F	M	SP	F,M	S	SP	F,M	S	SP	F,M	S	SP	F,M	S	04/16-05/31	05/01-05/31
009	Sams Valley		?	?	SS	?	?	SS	?	?	SS	?	?	SS	?	?	04/16-07/31	05/01-07/31
010	W. Perry Rd.-inactive																	
011	E. Perry Rd.-inactive																	
012	Up. Table Rock		P	E	SP	P,E	S	SP	P,E	S	SP	P,E	S	NG	P,E	S	04/15-05/15	05/01-05/15
013	Clear Creek		F	?	SS	F	S	SS	F	S	SS	F	S	SP	F	S	05/16-10/31	05/16-10/31
014	Obenchain		?	E	SP	E	S	SP	E	S	SP	E	S	SP	E	S	04/16-06/15	05/01-06/15
015	Lick Creek		?	?	SP	?	?	SP	?	?	SP	?	?	SP	?	?	04/16-05/15	05/01-05/
016	Brownsboro		P	E	SP	P,E	S	RR2	F,M	U	RR2	F,M	U	SP	P,E	S	04/16-05/31	05/01-05/31
017	Kanutchan	1	P	E	SP	P,E	S	DR	F,M	U	DR	F,M	U	DR	F,M	U	04/16-05/31	05/01-06/30
		2	P	E	SP	P,E	S	DR	F,M	U	DR	F,M	U	DR	F,M	U	04/16-05/31	05/01-06/30
018	Nichols		?	?	SU	?	?	SU	?	?	SU	?	?	SU	?	?	06/01-06/30	06/01-06/30
019	Sugarloaf		F	E	SP	F,E	S	SP	F,E	S	SP	F,E	S	SP	F,E	S	04/16-06/30	05/01-06/30
020	Eagle Pt Canal		P	M	SP	P,M	S	SP	P,M	S	SP	P,M	S	SP	P,M	S	04/16-06/30	05/01-06/30
021	Section 9		P	M	SP	P,M	S	SP	P,M	S	SP	P,M	S	SP	P,M	S	04/16-06/30	05/01-06/30
022	Section 7		?	E	SP	E	S	SP	E	S	SP	E	S	SP	E	S	04/16-05/31	05/01-05/31
023	Bull Run		F	E	SP	F,E	S	SP	F,E	S	SP	F,E	S	SP	F,E	S	04/01-06/15	05/01-06/15
024	Big Butte	1	F	E	RR2	F,E	U	RR2	F,M	U	RR2	F,M	U	RR2	F,M	U	04/15-05/31	05/01-05/31
		2	F	E	RR2	F,E	U	RR2	F,M	U	RR2	F,M	U	RR2	F,M	U	04/15-05/31	05/01-05/31
		3	F	E	RR2	F,E	U	RR2	F,M	U	RR2	F,M	U	RR2	F,M	U	04/15-05/31	05/01-05/31
		4	F	E	RR2	F,E	U	RR2	F,M	U	RR2	F,M	U	RR2	F,M	U	04/15-05/31	05/01-05/31
		5	F	E	RR2	F,E	U	RR2	F,M	U	RR2	F,M	U	RR2	F,M	U	04/15-05/31	05/01-05/31
		6	F	E	RR2	F,E	U	RR2	F,M	U	RR2	F,M	U	RR2	F,M	U	04/15-05/31	05/01-05/31
		7	F	E	RR2	F,E	U	RR2	F,M	U	RR2	F,M	U	RR2	F,M	U	04/15-05/31	05/01-05/31
		8	F	E	RR2	F,E	U	RR2	F,M	U	RR2	F,M	U	RR2	F,M	U	04/15-05/31	05/01-05/31
		9	F	E	RR2	F,E	U	RR2	F,M	U	RR2	F,M	U	RR2	F,M	U	04/15-06/30	05/01-06/30
		10	F	E	RR2	F,E	U	RR2	F,M	U	RR2	F,M	U	SP	F,M	U	06/01-07/15	06/01-07/15
		11	F	E	RR2	F,E	U	RR2	F,M	U	RR2	F,M	U	NG	F,M	U	06/01-07/15	06/01-07/15
025	Shadybranch		?	?	SP	?	?	SP	?	?	SP	?	?	SP	?	?	04/15-06/14	05/01-06/14
026	TouVelle		F	?	SP	F	S	SP	F	S	SP	F	S	SP	F	S	04/15-05/14	04/15-05/14
027	Reese Creek		F	E	SP	F,E	S	SP	F,E	S	SP	F,E	S	SP	F,E	S	05/01-05/31	05/01-05/31
029	Derby Rd. Sawmill		F	E	SS	F,E	S	SS	F,E	S	SS	F,E	S	SS	F,E	S	04/16-07/15	05/01-07/15
030	Derby Station		P	E	SP	P,E	S	SP	P,E	S	SP	P,E	S	SP	P,E	S	04/16-06/15	05/01-06/15
031	Summit Prairie	Rock Flat	P	E	RR2	F,M	U	DR	F,M	U	RR2	F,M	U	RR2	F,M	U	04/15-05/31	05/01-05/31
		Poverty Flat	P	E	RR2	F,M	U	DR	F,M	U	RR2	F,M	U	RR2	F,M	U	04/15-05/31	05/01-05/31
		McNeil	F	E	RR2	F,M	U	DR	F,M	U	RR2	F,M	U	RR2	F,M	U	04/15-05/31	05/01-05/31
		School house	F	E	RR2	F,M	U	DR	F,M	U	RR2	F,M	U	RR2	F,M	U	04/15-05/31	05/01-05/31
		1	F	E	SU	F,E	S	DR	F,M	S	DR	F,M	S	NG	F,M	S	06/01-09/30	06/01-09/30
		2	F	E	SU	F,E	S	DR	F,M	S	DR	F,M	S	NG	F,M	S	06/01-09/30	06/01-09/30
		3	F	E	SU	F,E	S	DR	F,M	S	DR	F,M	S	NG	F,M	S	06/01-09/30	06/01-09/30
		4	F	E	SU	F,E	S	DR	F,M	S	DR	F,M	S	NG	F,M	S	06/01-09/30	06/01-09/30
		5	F	E	SU	F,E	S	DR	F,M	S	DR	F,M	S	NG	F,M	S	06/01-09/30	06/01-09/30
		6	F	E	SU	F,E	S	DR	F,M	S	DR	F,M	S	NG	F,M	S	06/01-09/30	06/01-09/30
032	Patco Ranch		P	E	SP	P,E	S	SP	P,E	S	SP	P,E	S	SP	P,E	S	04/16-06/15	05/01-06/15
033	Lick Creek		?	?	SP	?	?	SP	?	?	SP	?	?	SP	?	?	04/15-06/14	05/01-06/14
034	W. Derby		F	M	SS	F,M	S	SS	F,M	S	SS	F,M	S	SS	F,M	S	04/16-07/15	05/01-07/15
035	Vestal Butte		P	E	SP	P,E	S	DR	F,M	S	SP	P,E	S	SP	P,E	S	04/16-06/15	05/01-06/15
038	Crowfoot		P	E	SS	P,E	S	DR	F,M	U	DR	F,M	U	RR2	F,M	U	04/16-07/15	05/01-07/15

Allotment Number	Allotment Name	Pasture No. and Name	Forested Sites Existing Forage Condition G,F,P or ?	Non-Forested Hardwoods Existing Ecological Condition L, M, E or ?	Alternative 1			Alternative 2			Alternative 3			Alternative 4			Max. Periods of Use	
					Grazing System	Condition	Trend	Grazing System	Condition	Trend	Grazing System	Condition	Trend	Grazing System	Condition	Trend	Existing Month/day	Proposed Month/day[1]
039	Crowfoot Cr.		P	M	SS	F,M	S	SS	F,M	S	SS	F,M	S	SS	F,M	S	04/16-07/15	05/01-07/15
040	Cobleigh Rd.		P	E	SS	P,E	S	SS	P,E	S	SS	P,E	S	SS	P,E	S	04/16-07/31	05/01-07/31
041	Moser Mtn.		?	?	SP	?	?	SP	?	?	SP	?	?	SP	?	?	04/01-04/30	04/01-04/30
043	Devon S.		?	?	SP	?	?	SP	?	?	SP	?	?	SP	?	?	04/16-06/30	05/01-06/30
044	Salt Crk. 2		P	M	SP	P,M	S	SP	P,M	S	SP	P,M	S	SP	P,M	S	04/16-06/30	05/01-06/30
045	Salt Crk. 3		P	M	SP	P,M	S	SP	P,M	S	SP	P,M	S	SP	P,M	S	04/16-06/30	05/01-06/30
046	Salt Crk. 1		?	?	SP	?	?	SP	?	?	SP	?	?	SP	?	?	04/16-06/30	05/01-06/30
0101	Chase Mtn.		P	E	SS	P,E	S	SS	P,E	S	SS	P,E	S	SS	P,E	S	05/01-10/01	05/01-10/01
0102	Edge Creek	Edge Creek	P	E	RR2	F,M	U	RR2	F,M	U	RR2	F,M	U	NG	F,M	U	05/01-06/15	05/01-06/15
		Ward Pasture	P	E	RR2	F,M	U	RR2	F,M	U	RR2	F,M	U	NG	F,M	U	05/01-06/15	05/01-06/15
		N. Pasture	P	E	SU	P,E	S	SU	P,E	S	SU	P,E	S	NG	F,M	U	06/15-10/01	06/15-10/01
0103	Buck Mtn.		P	E	SU	P,E	S	SU	P,E	S	SU	P,E	S	SU	P,E	S	06/01-10/01	06/01-10/01
0104	Buck Lake		P	E	SU	P,E	S	SU	P,E	S	SU	P,E	S	SU	P,E	S	07/01-10/15	07/01-10/15
0105	Johnson Prairie		P	E	SS	P,E	S	SS	P,E	S	SS	P,E	S	SS	P,E	S	05/01-10/31	05/01-10/31
0106	Deadwood	1	P	E	DR	F,M	U	DR	F,M	U	DR	F,M	U	DR	F,M	U	06/01-08/01	06/01-08/01
		1 2nd yr.	P	E	DR	F,M	U	DR	F,M	U	DR	F,M	U	DR	F,M	U	08/02-10/01	08/02-10/01
0107	Dixie	1	P	E	SP	P,E	S	SP	P,E	S	SP	P,E	S	SP	P,E	S	05/01-06/15	05/01-06/15
		2	P	E	SU	P,E	S	SU	P,E	S	SU	P,E	S	SU	P,E	S	06/15-10/01	06/16-10/01
0108	Jenny Creek		P	E	SU	P,E	S	SU	P,E	S	SU	P,E	S	SU	P,E	S	06/01-09/30	06/01-09/30
0109	Agate		P	E	SS	P,E	S	SS	P,E	S	SS	P,E	S	SS	P,E	S	05/01-07/15	05/01-07/15
0110	Soda Mtn.	1 Pilot Rock	P	E	RR2	F,M	U	RR2	F,M	U	RR2	F,M	U	NG	F,M	U	05/01-06/15	05/01-06/15
		2 Camp Creek	P	E	RR2	F,M	U	RR2	F,M	U	RR2	F,M	U	RR3	F,M	U	05/01-06/15	05/01-06/15
		3 OR Gulch	P	E	RR2	F,M	U	RR2	F,M	U	RR2	F,M	U	RR3	F,M	U	05/01-06/15	05/01-06/15
		4 Agate Flat	P	E	RR2	F,M	U	RR2	F,M	U	RR2	F,M	U	RR3	F,M	U	05/01-06/15	05/01-06/15
		5 Emigrant	P	?	DR	F	U	DR	F	U	DR	F	U	NG	F,M	U	06/15-08/15	06/15-08/15
		6 Lincoln	P	?	DR	F	U	DR	F	U	DR	F	U	NG	F,M	U	08/15-10/15	08/15-10/15
0111	Emigrant		?	?	SS	?	S	SS	?	S	SS	?	S	SS	?	S	04/15-10/31	04/15-10/31
0112	Cove Creek		F	E	SP	F,E	S	SP	F,E	S	SP	F,E	S	SP	F,E	S	04/01-06/15	05/01-06/15
0113	Poole Hill		P	E	SS	P,E	S	SS	P,E	S	SS	P,E	S	SS	P,E	S	05/01-10/15	05/01-10/15
0114	Buck Pt.		?	?	SP	?	S	SP	?	S	SP	?	S	SP	?	S	04/01-06/15	04/01-06/15
0115	Keene Creek	1	P	E	SP	P,E	D	DR	F,M	U	DR	F,M	U	NG	F,M	U	06/01-10/01	06/01-07/15
		2	P	E	SP	P,E	D	DR	F,M	U	DR	F,M	U	NG	F,M	U	06/01-10/01	07/16-10/01
		3	P	E	SP	P,E	D	DR	F,M	U	DR	F,M	U	NG	F,M	U	06/01-10/01	07/16-10/01
0116	Howard Prairie		P	E	SP	P,E	S	SP	P,E	S	SP	P,E	S	SP	P,E	S	04/01-06/15	04/01-06/15
0117	Conde Creek	1	P	E	SU	P,E	S	DR	F,M	U	DR	F,M	U	DR	F,M	U	06/15-08/15	06/15-08/15
		2	P	E	DR	F,M	U	DR	F,M	U	DR	F,M	U	DR	F,M	U	08/15-10/15	08/15-10/15
0118	Siskiyou		?	?	SS	?	?	SS	?	?	SS	?	?	SS	?	?	05/01-07/15	05/01-07/15
0119	Grizzly		P	E	SU	P,E	S	SU	P,E	S	SU	P,E	S	SU	P,E	S	07/15-09/01	07/15-09/01
0120	Baloy		P	E	SP	P,E	S	SP	P,E	S	SP	P,E	S	SP	P,E	S	04/15-07/01	04/15-07/01
0121	Lake Cr Spring	1	P	E	SP	P,E	S	RR4	F,M	U	SP	F,M	S	RR4	F,M	U	05/01-07/01	05/01-07/01
		2	P	E	SP	P,E	S	RR4	P,M	U	SP	P,E	S	RR4	P,M	U	05/01-07/01	05/01-07/01
		3	P	E	SP	P,E	S	RR4	F,M	U	SP	P,E	S	RR4	F,M	U	05/01-07/01	05/01-07/01
		4	P	E	SP	P,E	S	RR4	F,M	U	SP	P,E	S	RR4	F,M	U	05/01-07/01	05/01-07/01
0122	Lake Cr Summer		P	E	SU	P,E	S	SU	P,E	S	SU	P,E	S	SU	P,E	S	06/01-10/01	06/01-10/01
0123	Lost Creek		P	?	SP	P	S	SP	P	S	SP	P	S	SP	P	S	05/01-06/15	05/01-06/15
0124	Deer Creek		P	E	SS	P,E	S	SS	P,E	S	SS	P,E	S	SS	P,E	S	05/01-09/15	05/01-09/15
0125	South Heppsie		P	E	SS	P,E	S	SS	P,E	S	SS	P,E	S	SS	P,E	S	05/01-07/30	05/01-07/30
0126	Heppsie		P	M	SS	P,M	D	SS	P,M	S	SS	P,M	S	SS	P,M	D	04/16-10/16	05/01-10/01
0127	Cartwright		P	?	SS	P	S	SS	P	S	SS	P	S	SS	P	S	05/01-08/31	05/01-08/31
0129	Hunger Flat		F	E	SP	F,E	S	SP	F,E	S	SP	F,E	S	SP	F,E	S	04/16-06/30	05/01-06/30
0132	Antelope Rd.		P	E	SP	P,E	S	SP	P,E	S	SP	P,E	S	SP	P,E	S	04/16-06/30	05/01-06/30
0133	Brownsborro		P	E	SP	P,E	S	SP	P,E	S	SP	P,E	S	SP	P,E	S	04/01-06/15	04/01-06/15
0134	Yankee Reser.		P	E	SP	P,E	S	SP	P,E	S	SP	P,E	S	SP	P,E	S	05/01-06/15	05/01-06/15
0136	Canal		P	E	SP	P,E	S	SP	P,E	S	SP	P,E	S	SP	P,E	S	04/16-06/15	05/01-06/15
0137	Box R Ranch		P	E	W	P,E	S	W	P,E	S	W	P,E	S	W	P,E	S	10/01-02/28	10/01-02/28
0139	I-5		P	E	SS	P,E	S	SS	P,E	S	SS	P,E	S	SS	P,E	S	05/01-07/30	05/01-07/30
0140	Dry Lake		P	?	SS	P	S	SS	P	S	SS	P	S	SS	P	S	05/15-09/15	05/15-09/15
0141	Chicken Hills		P	?	SS	P	S	SS	P	S	SS	P	S	SS	P	S	05/15-09/15	05/15-09/15
0142	Long Lake		?	?	SS	?	S	SS	?	S	SS	?	S	SS	?	S	06/16-09/30	06/16-09/30
0143	Cove Ranch		?	?	SU	?	?	SU	?	?	SU	?	?	SU	?	?	07/01-11/30	07/01-11/30
0144	Bybee Peak		P	E	SS	P,E	S	SS	P,E	S	SS	P,E	S	SS	P,E	S	05/01-07/31	05/01-07/31
0145	Box "D" Ranch		P	?	SS	P	S	SS	P	S	SS	P	S	SS	P	S	03/31-04/30	03/31-04/30
0147	Grubbs Spring		P	?	SU	P	S	SU	P	S	SU	P	S	SU	P	S	06/01-10/15	06/01-10/15
0148	N. Cove Creek		?	?	SP	?	?	SP	?	?	SP	?	?	SP	?	?	04/01-06/15	04/01-06/15
0202	Tunnel Ridge		?	?	SS	?	?	SS	?	?	SS	?	?	SS	?	?	05/20-09/20	05/20-09/20
0203	Billy Sugarloaf		?	?	SP	?	?	DR	?	?	DR	?	?	SP	?	?	04/15-06/30	04/15-06/30
0204	Timber Mtn.		?	?	SS	?	?	SS	?	?	SS	?	?	SS	?	?	04/15-07/15	04/15-07/15
0206	Lower Big Applegate	1	F	E	SP	F,E	S	RR2	F,M	U	RR2	F,F	U	RR2	F,M	U	04/15-06/30	04/15-06/30
		2	F	E	SP	F,E	S	RR2	F,M	U	RR2	F,F	U	RR2	F,M	U	04/15-06/30	04/15-06/30

Allotment Number	Allotment Name	Pasture No. and Name	Forested Sites Existing Forage Condition G,F,P or ?	Non-Forested Hardwoods Existing Ecological Condition L, M, E or ?	Alternative 1			Alternative 2			Alternative 3			Alternative 4			Max. Periods of Use	
					Grazing System	Condition	Trend	Grazing System	Condition	Trend	Grazing System	Condition	Trend	Grazing System	Condition	Trend	Existing Month/day	Proposed Month/day[1]
0207	Sterling Creek	1	F	E	DR	F,M	S	DR	F,M	S	DR	F,F	S	DR	F,M	S	04/15-05/15	04/15-05/15
		2	F	E	DR	F,M	S	DR	F,M	S	DR	F,F	S	DR	F,M	S	05/15-06/15	05/15-06/16
0208	Spencer Gulch		?	?	SU	?	?	SU	?	?	SU	?	?	SU	?	?	07/01-09/30	07/01-09/30
0209	Quartz Gulch - Inactive																	
0210	Stiehl		?	?	SP	?	?	SP	?	?	SP	?	?	SP	?	?	04/16-05/31	04/16-05/31
0211	Fielder Creek		?	?	SP	?	?	SP	?	?	SP	?	?	SP	?	?	04/01-06/15	04/15-06/15
0213	Chapman Creek		F	E	SS	F,E	D	SS	F,E	D	SS	F,E	D	DR	F,E	D	04/16-07/15	04/16-07/15
0216	Del Rio		?	?	SS	?	?	SS	?	?	SS	?	?	SS	?	?	04/01-11/15	04/16-10/31
0217	Ecker		?	?	SS	?	?	SS	?	?	SS	?	?	SS	?	?	04/16-07/15	04/16-07/15
0218	Stage Road		?	?	SS	?	?	SS	?	?	SS	?	?	SS	?	?	04/16-07/15	04/16-07/15
0219	Foots Creek		?	?	SP	?	?	SP	?	?	SP	?	?	SP	?	?	04/01-05/31	04/16-05/31
0221	Rock Gulch - Inactive																	
0222	Lomas Road		?	?	SS	?	?	SS	?	?	SS	?	?	SS	?	?	04/15-09/15	04/15-09/15
0223	Star		?	?	SS	?	?	SS	?	?	SS	?	?	SS	?	?	05/01-08/31	05/01-08/21
0302	Pickett Mtn.		?	?	SS	?	?	SS	?	?	SS	?	?	SS	?	?	04/01-08/31	04/01-08/31
0303	Jump Off Joe		?	?	SP	?	?	SP	?	?	SP	?	?	SP	?	?	04/16-05/15	04/06-05/15
0308	Deer Creek	1	?	?	SP	?	?	SP	?	?	SP	?	?	SP	?	?	04/01-05/31	04/01-05/31
		2	?	?	SP	?	?	SP	?	?	SP	?	?	NG	?	?	04/01-05/31	04/01-05/31
		3	?	?	SP	?	?	SP	?	?	SP	?	?	NG	?	?	05/01-06/15	05/01-06/15
		4	?	?	W	?	?	W	?	?	W	?	?	NG	?	?	10/16-12/15	10/16-12/15
0309	Reeves Creek		?	?	DR	?	?	DR	?	?	DR	?	?	DR	?	?	04/15-05/20	05/21-07/01
0310	Q Bar X		?	?	W	?	?	W	?	?	W	?	?	W	?	?	11/01-02/28	11/01-02/28
0312	Esterly		?	?	SS	?	?	SS	?	?	SS	?	?	SS	?	?	04/01-07/03	04/01-07/31
0315	Glade Creek		?	?	SS	?	?	SS	?	?	SS	?	?	SS	?	?	04/20-07/31	04/20-07/31
0316	Cherry Gulch		?	?	SP	?	?	SP	?	?	SP	?	?	SP	?	?	04/01-05/30	04/01-05/30

Key:

Grazing System

DR - Deferred Rotation
RR2 -Rest Rotation (2 pastures - rest every other year)
RR3 -Rest Rotation (3 pastures - rest one out of three each year)
RR4 -Rest Rotation (4 pastures - rest one out of four each year)
SP -Spring
SU -Summer
SS -Spring/Summer
W -Winter
NG -No Grazing (exclusion)

Forage Condition - Forested Sites: G = good; F = fair; P = poor; ? = no data
Ecological Condition - Nonforested and hardwood sites: L = late; M = middle; E = early; ? = no data
Trend: U = upward; S = static; D = downward; ? = no data

[1] Turn out dates may vary by 2 weeks depending on annual weather conditions

Appendix D

Standard Procedures and Design Elements for Range Improvements

The following standard procedures and design elements will be adhered to under all alternatives in administering the grazing management program and constructing range improvements in the EIS area. Design elements have been standardized over time to mitigate adverse effects encountered during range improvement installations.

- Site-specific environmental analysis prior to implementation of range improvements is required. Proposed range improvements may be modified or abandoned if this analysis indicates significant adverse environmental impacts cannot be mitigated or avoided.

- A wilderness inventory, required by the Federal Land Policy and Management Act, has been completed in the EIS area. All rangeland management activities in the wilderness study area will be consistent with the interim Management Policy and Guidelines for Lands Under Wilderness Review unless and until the area is removed from this category. Impacts will be assessed before implementing management activities to ensure they meet guidelines.

- Visual values will be considered during the design and development of the project. Visual resource contrast ratings will be completed as part of the site-specific environmental assessment for projects in visually sensitive areas or with high potential for adverse visual impacts. As appropriate, mitigating measures will be developed (BLM Manual 8400).

- Every effort will be made to avoid adverse impacts to cultural resources. An appropriate cultural resources inventory is required on all areas prior to any ground-disturbing activities. This will be part of the preplanning stage of a project and the results would be analyzed in the environmental assessment addressing the action (BLM Manual 8100, Cultural Resources Management). If significant cultural values are discovered, the project could be relocated, redesigned or abandoned. However, where that is not possible, the BLM will consult with the State Historic Preservation Officer and the Advisory Council on Historic Preservation in accordance with the Programmatic Memorandum of Agreement (PMOA) by and between the Bureau, the Council and the National Conference of State Historic Preservation Officers, dated January 14, 1980, which sets forth a procedure for developing appropriate mitigative measures. This PMOA identifies procedures for compliance with Section 106 of the National Historic Preservation Act (1966) and Executive Order 11593, as implemented by 36 CFR Part 800.

- Prio to vegetation manipulation and development of range improvements, BLM requires a survey of the project site for plants and animals listed or under review for listing on Federal or offical State lists of threatened and endangered species. If a project might affect any such species or its critical habitat, every effort will be made to modify, relocate or abandon the project in order to obtain a no effect determination. Consultation with the U. S. Fish and Wildlife Service will be initiated (50 CFR 402; Endangered Species Act of 1973, as amended) when BLM determines that a proposed action may affect Federally-listed plant or animal species. In addition, some plants in the Medford EIS area are considered by BLM as sensitive and are managed under the same procedures as plants under review for Federal listing.

- Surface disturbance at all project sites will be held to a minimum. Disturbed soil will be rehabilitated to blend into the surrounding soil surface and reseeded as needed with a mixture of grasses, forbs and browse as applicable to replace ground cover and reduce soil loss from wind and water erosion.

- All State of Oregon water quality regulations will be adhered to.

- All water developments will provide standing water for wildlife outside of troughs where a need is identified by BLM. Significant spring sources and associated trough overflow areas will be fenced. Wildlife watering ramps, rocks, or floatboard will be provided in all water troughs for small birds and mammals to gain access to and/or escape from the water.

- All fences will be constructed in accordance with Bureau standards. Gates or cattleguards will be installed where fences cross existing roads with significant use.

- Vegetation manipulation projects will be designed using irregular patterns, untreated patches, etc., to provide for optimum edge effect for visual and wildlife. Layout and design will be coordinated with local Oregon Department of Fish and Wildlife biologists. No vegetation manipulation will be done in riparian zones that contain significant riparian vegetation. A vegetative screen will be retained between permanent roads and created forage areas.

• Prescribed burning will be designed in accordance with the guidelines contained in the Oregon Department of Forestry's Smoke Management Plan (Oregon Department of Forestry, 1981 and 1982), which would prevent smoke from intruding into smoke-sensitive areas.

• Preparation for seeding (brush control) will be by mechanical, burning or chemical means. Burning will use one or more of the following types of fire breaks: natural barriers, retardant lines, existing roads and/or bladed lines. Each fire will have its own prescription, to be based on the conditions needed (wind speed, air temperature, etc.) to burn the plant material within the project boundary to be burned. All herbicide applications will be in accordance with the manufacturer's label, State regulations, and BLM Manual 9220. A more thorough description of design features applicable to herbicide use may be found in BLM's final environmental impact statement, Vegetative Management with Herbicides — Western Oregon (USDI, BLM 1978d). Herbicides most commonly proposed for use include 2,4-D, Picloram, Amitrole-T, Asulam, Dalapon, Atrazine, Glyphosate, and Hexazinone. Season of use would be at any time of the year, and diesel oil would be used as a carrier.

Seeding of cut-over forest areas with a grass-legume mixture will be coordinated with timber management objectives. Seeding will be accomplished by use of the rangeland drill, aerial or broadcast seeding. Broadcast or aerial seeding will occur on small disturbed areas, rough terrain and rocky areas. BLM will determine seeding mixtures on a site specific basis, using past experience and recommendations of the Oregon State University Extension Service and Experiment Stations and/or Oregon Department of Fish and Wildlife. Anticipated increases in production through vegetation manipulation projects will not be allocated until seedings are established and ready for use. Usually, seedings on non-commercial forest lands will be deferred from grazing for at least two growing seasons to allow seeding establishment.

• Most individual units for vegetative manipulation and/or seeding will be 150 acres or less.

• No permanent roads will be created for range improvement construction. Temporary roads will be closed to off-road vehicle use, blocked, camoflaged and seeded after completion of range improvement construction. Some areas will be formally designated as closed to off-road vehicle use in accordance with 43 CFR 8342.

• Hardwood removal on oak woodlands will attempt to maintain a forage to cover ratio of 60 to 40. Forage areas created will not be so large that any area is over 660 feet from cover. Oak canopy cover will not be reduced to less than 10 percent. Oak or hardwood leave trees will be approximately 12 to 14 inches or greater in diameter breast height (dbh).

• Normal maintenance such as replacement of fence posts and retreatment of vegetation manipulations will occur.

• A monitoring program will be developed to measure whether resource objectives were being met. Water quality monitoring will continue in accordance with Executive Orders 11991 and 12088, BLM Manual 7240, and Sections 208 and 313 of the Clean Water Act (P.L. 95-217, P.L. 92-500 as amended).

Studies will be established in representative riparian zones and other wildlife habitat areas to determine changes in the habitat conditions and populations of fish and wildlife resulting from implementation. Such monitoring will comply with Executive Orders 11514 and 11990 and BLM Manual 6602 and 6740.

Climate, actual use, utilization and trend studies will be continued in accordance with BLM Manuals 4412 and 4413 to evaluate vegetation changes.

• If an evaluation supports an increase in livestock grazing use, the additional use will first be granted on a temporary basis. An evaluation of forage production and the temporary use granted must confirm the availability of additional forage before an increase in use would become permanent. Grazing management will be revised if the evaluation determines that the specific objectives established for the allotments are not being achieved. Other revisions may include changes in the amount of livestock use permitted, grazing system, period of use, or any combination of these. Prior to these changes, further environmental analysis will be completed.

• Each operator will be issued leases which specify allotment, period of use, and numbers and kind of livestock. If unauthorized use should occur, action will be taken by BLM to eliminate it in accordance with regulations in 43 CFR 4150.

Benefit Cost Analysis (Alternative 3)

A preliminary benefit cost analysis was conducted for Alternative 3, Preferred Alternative. Benefits were discounted at 7.875 percent. A final benefit/cost analysis will be conducted prior to the decision and the results published in the Rangeland Program Summary. The results of the preliminary B/C analysis for Alternative 3 are shown below, by allotment.

Allotment	B/C Ratio
001	3.6
024	5.6
031	13.5
038	20.9
106	6.6
107	7.3
110	3.1
115	3.4
117	8.9
203	4.7
206	28.9

Appendix D, Table D-1 Proposed Range Improvements [1,2]

Allotment Number	Allotment Name	Alternative 2									Alternative 3								
		Fence	Corrals	Ponds	Spring Dev.	Hardwood Removal/ Seed	Brush Control/ Seed	Meadow Seeding	Seeding cut-over forested areas	Other Seeding	Fence	Corrals	Ponds	Spring Dev.	Hardwood Removal/ Seed	Brush Control/ Seed	Meadow Seeding	Seeding cut-over forested areas	Other Seeding
001	Lost Creek	20.0	1	0	7	2,362	346	667	157	0	16	1	0	3	1,575	173	0	157	0
004	Long Branch	0	0	0	0	0	0	0	255	0	0	0	0	0	0	0	0	0	0
007	Strove Ranch	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
017	Kanutchan Field	0	0	0	0	742	0	0	0	0	0	0	0	0	0	0	0	0	0
024	Big Butte	5.8	3	2	11	3,147	585	806	650	0	5.8	1	2	11	2,098	293	228	650	0
031	Summit Prairie	28.2	0	0	6	783	745	47	1,625	0	21.1	0	0	6	522	372	47	1,625	0
035	Vestal Butte	3.4	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
038	Crowfoot	12.1	0	0	6	2,172	326	15	100	734	2.6	0	2	6	1,448	75	15	100	0
106	Deadwood	5.0	1	3	2	0	0	118	824	0	3.0	1	3	2	0	0	0	100	0
107*	Dixie	6.0	1	3	2	358	0	295	193	1,708	3.0	1	3	2	250	427	250	0	0
110*	Soda Mountain	30.0	3	4	5	2,592	1,236	1,454	408	4,502	24.0	3	4	5	1,106	929	1,381	492	3,299
115	Keene Creek	11.0	3	4	2	0	370	55	1,000	0	8.0	3	4	2	0	0	453	1,000	0
117	Conde Creek	4.0	1	2	2	0	0	128	465	0	4.0	2	2	2	0	0	100	465	0
119*	Grizzly	3.0	0	3	2	421	602	0	22	40	0	0	0	0	0	0	0	0	0
121	Cascade Ranch	12.5	1	2	2	0	472	0	0	788	0	0	0	0	0	0	0	0	0
203	Billy & Sugarloaf Mtn.	10.0	0	6	6	0	2,500	0	0	0	10.0	0	3	3	0	1,500	0	0	0
206*	Lower Big Applegate	22.0	0	19	2	0	2,000	30	300	0	15.0	0	14	2	0	700	0	200	0
207*	Sterling Creek	20.0	4	10	10	0	2,500	0	200	0	0	0	0	0	0	0	0	0	0
213	Chapman Creek	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	**193.0**	**18**	**58**	**68**	**12,577**	**11,682**	**3,615**	**6,199**	**7,772**	**112.5**	**12**	**37**	**44**	**6,999**	**4,469**	**2,474**	**4,789**	**3,299**

[1] No range improvements are proposed under Alternative 1, No Action.
[2] Units shown are miles of fence; number of corrals, ponds and spring developments; acres of brush control, hardwood removal and seeding.

Allotment Number	Allotment Name	Alternative 4								
		Fence	Corrals	Ponds	Spring Dev.	Hardwood Removal/ Seed	Brush Control/ Seed	Meadow Seeding	Seeding cut-over forested areas	Other Seeding
001	Lost Creek	11.5	0	0	5	787	173	0	50	445
004	Long Branch	0	0	0	0	738	166	50	439	508
007	Strove Ranch	0	0	0	5	495	275	50	50	0
017	Kanutchan Field	0	0	0	0	323	87	10	0	85
024	Big Butte	0	0	0	11	1,049	293	768	50	0
031	Summit Prairie	0	0	0	6	261	373	42	125	0
035	Vestal Butte	0	0	0	3	151	21	0	0	0
038	Crowfoot	1.4	0	2	9	724	163	15	100	488
106	Deadwood	7.0	1	3	2	0	0	100	824	0
107*	Dixie	10.0	1	3	2	0	427	200	0	0
110*	Soda Mountain	21.0	2	4	2	596	209	630	0	890
115	Keene Creek	0	0	0	0	0	0	0	0	0
117	Conde Creek	6.0	2	2	2	0	0	100	465	0
119*	Grizzly	0	0	0	0	0	10	22	100	0
121	Cascade Ranch	12.5	0	2	0	0	197	0	0	0
203	Billy & Sugarloaf Mtn.	2.0	0	6	6	0	1,500	0	0	0
206*	Lower Big Applegate	20.0	0	19	2	0	1,700	0	600	0
207*	Sterling Creek	10.0	0	10	10	0	2,000	0	200	0
213	Chapman Creek	5.0	0	0	3	0	300	0	50	0
	Total	**106.4**	**6**	**51**	**65**	**5,124**	**7,894**	**1,987**	**3,053**	**2,416**

Appendix E

Determination of Existing and Predicted Ecological Range Condition and Trend

Determination of existing range conditions: Two methods were used for determination of range conditions. In the dry upland zone (see Figure 2-1 and Table 2-1), ecological condition was based on the relative degree to which the kinds, proportions, and amounts of plants in each plant community resemble that of the potential plant community for the site utilizing procedures as outlined in USDA, SCS (1976). Descriptions of each range site are in USDI, BLM (1978b) located in the Medford District.

Four ecological condition classes were used to express the degree to which the composition of the present plant community reflects that of climax. They are:

Ecological Condition	Percent of Present Plant Community that is Climax for the Range Site
Climax	76 - 100
Late	51 - 75
Middle	26 - 50
Early	0 - 25

Forage condition was used as the second method. This procedure was used in the forested areas and was based on the amount of desirable and intermediate grass, forbs and shrubs found on a forested site. Forage condition was related to the acres of timber harvest and the preference for species that increase after logging on a forested site.

Excellent - 76 - 100%
Good - 51 - 75
Fair - 26 - 50
Poor - 0 - 25

Determination of Predicted Range Condition

The determinations of predicted condition are based on the discussion of vegetation allocation and grazing systems in Chapter 3. Variables such as year to year fluctuations in precipitation, timing of precipitation, and temperatures during growing season make a precise quantification of impacts to vegetation impossible. The impact analysis methodology, therefore, produces a result which is most useful as a relative comparison between alternatives rather than as an absolute prediction of the impacts of implementing any one alternative.

The following analysis of impacts to forage condition on Allotment 117 illustrates, for one allotment, how the components of the proposed action and alternatives would result in changes in long-term forage conditions summarized in Table 3-1.

Approximately 50 percent of the 4,800 acres of public land in Allotment 117 is currently used in the spring every year. The remainder is deferred until later in the season. Existing ecological conditions on non-forested sites are late (50 acres), middle (53 acres), and early (212 acres). In forested areas, forage conditions are fair (983 acres) and poor (3,523 acres). The existing level of livestock use is within the grazing system.

Range improvements called for under the proposed action include 4 miles of fence, 2 corrals, and 4 water developments. Seeding would occur on 565 acres. The grazing system under the proposed action would be deferred rotation. Significant increases in desirable forage species are expected to result from the above proposals for four reasons:

1. Utilization of forage would be in a more uniform pattern due to fencing of pastures in allotments. Thus, livestock would not be allowed to selectively graze desirable species only.

2. Storage of carbohydrate reserves by key herbaceous species would take place under a deferred rotation grazing system.

3. Forage condition would improve by seeding 565 acres with compatible site specific grass species.

Determination of Trend of Range Condition

The present range condition does not indicate whether the plant community is improving or deteriorating in relation to its potential. Trend is a determination in relation to its potential. Trend is a determination for assessing what is currently happening to the plant community. The present range condition is a result of a sustained trend over a period of time.

Trend in the EIS area was determined by observed apparent trend and permanent trend study plots located throughout the area. Apparent trend is a professional judgment rating based on several indicators such as plant vigor, reproduction of key species and soil loss. This trend rating was correlated with permanent trend study plot data to give a final trend rating for each pasture.

Determination of Predicted Trend in Range Condition

Predictions of long term trend in range condition were based primarily on proposed grazing systems at the pasture level. Systems which allow key forage plants the opportunity to complete the stages of growth would result in upward trend. Trend was predicted to be downward on areas which would be grazed under systems which would not allow key forage species the opportunity to complete growth. Existing condition or trend was not a factor in determining long term predicted trend.

Appendix F - Scientific Names of Plants Mentioned in the EIS

Alder	*Alnus spp.*
Big leaf maple	*Acer macrophyllum*
Birchleaf mahogany	*Cercocarpus Betuloides*
Blackberry	*Rubus spp.*
Blackoak	*Quercus kelloggii*
Bluebunch wheatgrass	*Agropyron spicatum*
Bluegrass	*Poa spp.*
Blue wild ryegrass	*Elymus glacus*
Buttercup	*Rannunculus spp.*
California oatgrass	*Danthonia californica*
Carex	*Carex spp.*
Cheatgrass	*Bromus tectorum*
Cinquefoil	*Pontentilla spp.*
Clover	*Trifolium spp.*
Cottonwood	*Populus tricocarpa*
Deerbrush	*Ceanothus integerrimus*
Douglas-fir	*Pseudotsuga menziesii*
Hazel	*Corylus cornuta*
Hellebore	*Veratrum spp.*
Idaho fescue	*Festuca Idahoensis*
Junegrass	*Koeleria cristata*
Lemon needlegrass	*Stipa lemmoni*
Madrone	*Arbutus menziesii*
Manzanita	*Arctostaphylos spp.*
Mountain brome	*Bromus marginatus*
Mountain mahogany	*Cercocarpus montanus*
Ninebark	*Physocarpus spp.*
Oceanspray	*Holodiscus discolor*
Oregon ash	*Fraxinus latitolia*
Oregon grape	*Berberis spp.*
Pachystima	*Pachystima myrsinites*
Pacific brome	*Bromus laviperis*
Pathfinder	*Adenocavlon bicolor*
Peavine	*Lathyrus*
Prince's pine	*Chimaphilia menziesii*
Ponderosa pine	*Pinus ponderosa*
Quaking aspen	*Populus tremuloides*
Rabbitbrush	*Chrysothamnus spp.*
Redstem	*Ceanothus sanguinia*
Shasta fir	*Abies magnifica*
Snowbrush	*Ceanothus velutinus*
Spirea	*Spirea douglasii*
Strawberry	*Fragaria spp.*
Sugar pine	*Pinus lambertiana*
Tufted hairgrass	*Deschampsia caespitosa*
Velvetgrass	*Holcus lanatus*
Vetch	*Vicia spp.*
Vine maple	*Acer circinatum*
Wedgeleaf	*Ceanothus cuneatus*
White fir	*Abies concolor or grandis*
White oak	*Quercus garryana*
White pine	*Pinus monticola*
Willow	*Salix spp.*

Appendix G - Riparian and Stream Habitat Iventory Methodologies

Methods and Materials

This riparian zone survey was conducted during the 1981 and 1982 field seasons in the Butte Falls and Klamath Resource Areas, Medford District, Bureau of Land Management (BLM). An attempt was made to survey 100 percent of the Class 1 and 2 streams in both resource areas. Class 3 to 5 streams were randomly sampled (6.3 percent in the Butte Falls Resource Area and 5.3 percent in the Klamath Resource Area).

Transportation maps of the resource areas were utilized to determine the sections of all the streams on BLM administered lands. Each stream segment was numbered, Class 1 and 2 by mile and Class 3 to 5 in one-half mile segments. A random number table was used to select the Class 3 to 5 streams to be sampled. A sufficient number was selected to cover the time allotted. These segments of "miles," as they will be referred to hereafter, were numbered separately for each resource area.

Each section or mile of stream was surveyed separately. For each mile, a map was drawn showing significant features within the riparian, stream, and upland zones. A species list of the flora and fauna was maintained. For each plant species, an ocular estimate of percent foliar cover was made. Other measurements included aspect, slope, canopy cover, bank slopes, stream width and depth, and riparian zone width. A mean and range was noted for each measurement. Streambed composition and character were noted. Terrestrial vertebrate and avian species were recorded when observed or identified by sign (scat, track) or vocalization (song).

Three numerical ratings were made for each vegetative community of each mile surveys: the Habitat Diversity Index (HDI), condition, and trend. The HDI is an evaluation of the complexity of the vegetation, physical features, and unique features of a site. In general, riparian wildlife communities are influenced more by structural form of the vegetation than by species composition. The type, size, and arrangement of canopy, shrubs, and herbaceous vegetation are major contributors to the suitability as a site for wildlife.

The riparian zone condition is a numerical rating of the overall condition of the community. It is based on the vegetation age and composition, bank conditions, and the impacts of logging, grazing, and/or roads. The total rating is classified as excellent, good, fair, or poor.

The observed apparent trend is a numerical rating of the progress of succession of the community. It is rated as downward, static, or upward, and is based on plant vigor, seedling establishment, age class representation, vegetation composition, amount and distribution of litter, and the amount and severity of pedestalling.

Influences upon the trend were observed and ranked according to their relative impact upon the riparian zone. Logging, grazing, and roads were the principle factors influencing the successional state of the communities and the amount of influence was a subjective interpretation of the examiner based on observable influences.

All Class 1 and 2 streams with a riparian zone were classified. Those Class 3 to 5 streams without a riparian zone did not have a condition, trend, or HDI rating completed. Each riparian community of the Class 1 and 2 streams had a step-point transect performed. The step-point provides relative percent of each plant species and plant forms found in each canopy level of the sample. Each transect had a 50 meter transect parallel to the stream on each side and a minimum 5 meter perpendicular transect from the stream edge on each bank. Step-points were conducted at the most "typical" site in each community.

Horizontal-vertical vegetation structure drawings were made at the same location as the step-point. One was drawn in a 10 meter by 2 meter strip on the left bank, a second was perpendicular from the stream edge, which included the topography of the stream channel and banks.

Step-points and horizontal-vertical drawings were not done on Class 3 to 5 streams. Photographs were taken for each stream at representative sites, step-point sites, and any encountered special features. For more information, see Culbertson and Montgomery (1982) on file in the Medford District Office.

Criteria For Evaluating Stream Conditions, Trend and Potential for Fishery Habitat

Present Fishery Habitat Condition

Stream fishery habitat condition rating for salmonid fish, which include chinook and coho salmon, as well as steelhead, cutthroat, rainbow, and brook trout were obtained by walking along streams on public land and documenting their physical and biological characteristics over specific unit lengths, generally one-quarter mile. Ten to thirteen characteristics were rated for each stream segment depending on data availability and flow characteristics. These factors included the flow difference between winter and summer, approximate maximum summer water temperature, bank stability, percent shade on stream at midday, pool quality, spawning area, rearing area, composition of bottom material, pool-riffle ratio, stream gradient, conductivity, channel stability and in-stream habitat diversity. The sum of rating values for all stream characteristics determined the overall rating for that particular stream segment. This habitat condition rating system resulted in four potential major categories: Excellent, Good, Fair, and Poor. A "Good to Fair" subcategory facilitated description of a large number (37 percent) of stream miles in marginally good condition.

Prediction of Habitat Trend and Condition

The fact that streams function as a continuum throughout their watersheds complicates prediction of habitat condition, trend, and improvement effects since human-related activities (e.g. timber harvest along streams and erosion of unsurfaced roads) or natural processes (e.g. recovery of stream canopy cover following timber harvest) influence the stability and quality of fishery habitat in the immediate vicinity as well as downstream. With a few exceptions, agricultural water diversions and impacts associated with timber harvest in the entire EIS area have far more influence on stream habitat quality than does livestock grazing. These types of external influences were considered in the habitat trend and condition analyses for Alternatives 2, 3, and 4.

All Class 1 and 2 streams susceptible to significant livestock grazing impacts are listed in Appendix G, Table G-2. For this reason, the impact analysis does not consider possible effects of each alternative on streams not in Table G-2.

Some streams had been surveyed in 1974-1976, so whenever possible, current trend was determined by comparing past and present habitat conditions. On these and other streams trend was also estimated by considering the extent of erosion of unsurfaced roads; the extent of natural, human, or livestock-related disturbance to streambanks; reproduction of woody riparian species; past and current influence of timber harvest on fishery habitat and general trends in historical, livestock stocking levels. Predicted trend was based on the potential for range improvements and grazing systems to appreciably affect the habitat trend of a stream, given that off-site influences may be more important for limiting habitat quality on public land than on-site damage from livestock.

Fishery habitat improvement potential is a measure of the difference between potential and present fishery habitat condition. More vigorous and diverse riparian vegetation and less streambank erosion can result in a narrower stream channel and greater pool depth, stable undercut banks that provide resting and hiding cover, overhanging vegetation that provides better water temperature control and a food source of terrestrial insects. Increased water velocity that results from a narrower stream channel removes sediments that have accumulated over spawning gravel and over cobbles that are important for aquatic insect production.

Appendix G, Table G-1 Streamside Riparian Habitat - Predicted Trend and Condition

			Alt. 1 No Action			Alt. 2 Emphasize Livestock			Alt. 3 Preferred Alternative			Alt. 4 Emphasize Non Livestock		
Streams	Allot	Miles	Exist. Cond.	Grazing System	Cond.	Trend	Grazing System	Cond.	Trend	Grazing System	Cond.	Trend	Grazing System	Cond.	Trend
ELK CREEK	1	.45	E	SP	E	S	RR	E	**S**	DR	E	S	DR	E	S
ELK CREEK	1	1.00	F	SP	F	D	NG	G	**U**	NG	G	U	NG	G	U
ELK CREEK	1	.20	G	SP	G	S	RR	G	**U**	DR	G	U	DR	G	U
LOST CREEK	1	.50	F	SP	F	D	RR	G	**U**	DR	G	U	NG	G	U
ALCO	2	.25	G	SU	G	S	SU	G	**S**	SU	G	S	SU	G	S
EAST FORK WEST	2	.30	F	SU	G	U	SU	G	**U**	SU	G	U	SU	G	U
EAST FORK WEST	2	.80	G	SU	G	U	SU	G	**U**	SU	G	U	SU	G	U
ELK HORN	2	1.20	E	SU	E	U	SU	E	**U**	SU	E	U	SU	E	U
FLAT CREEK	2	.40	F	SU	G	U	SU	G	**U**	SU	G	U	SU	G	U
FLAT CREEK	2	.30	F	SU	F	S	SU	F	S	SU	F	S	NG	G	U
FLAT CREEK TRAIL	2	.25	E	SU	E	S	SU	E	S	SU	E	S	SU	E	S
HAWK CREEK	2	.50	G	SU	G	U	SU	G	U	SU	G	U	SU	G	U
HAWK CREEK	2	.50	E	SU	E	U	SU	E	U	SU	E	U	SU	E	U
SUGAR PINE	2	1.25	G	SU	G	S	SU	G	S	SU	G	S	SU	G	S
TIMBER	2	1.10	G	SU	G	S	SU	G	S	SU	G	S	SU	G	S
WEST BRANCH ELK CR.	2	.40	G	SU	G	S	SU	G	S	SU	G	S	SU	G	S
WEST BRANCH ELK CR.	2	.25	G	SU	G	U	SU	G	U	SU	G	U	SU	G	U
WEST BRANCH ELK CR.	2	.50	F	SU	F	S	SU	F	S	SU	F	S	NG	G	U
WEST BRANCH ELK CR.	2	1.30	G	SU	G	S	SU	G	S	SU	G	S	SU	G	S
WEST BRANCH ELK CR.	2	.40	E	SU	E	S	SU	E	S	SU	E	S	SU	E	S
TRAIL CREEK	3	.50	G	SS	G	S	SS	G	S	SS	G	S	SS	G	S
WALL CREEK	3	1.20	G	SS	G	S	SS	G	S	SS	G	S	SS	G	S
WALL CREEK	3	.70	E	SS	E	S	SS	E	S	SS	E	S	SS	E	S
SOUTH BOUNDARY CREEK	13	.50	F	SS	F	S	SS	F	S	SS	F	S	NG	G	U
SOUTH BOUNDARY CREEK	13	.40	E	SS	E	S	SS	E	S	SS	E	S	SS	E	S
SOUTH BOUNDARY CREEK	13	.20	P	SS	P	S	SS	P	S	SS	P	S	NG	F	U
REESE	20	.60	F	SP	F	S	SP	F	S	SP	F	S	NG	G	U
NORTH FORK BUTTE CREEK	24	2.80	G	RR	G	S	RR	G	S	RR	G	U	RR	G	U
NORTH FORK BUTTE CREEK	24	1.90	F	RR	F	S	RR	F	S	RR	F	U	NG	G	U
CAMP CREEK	24	1.30	G	RR	G	S	RR	G	S	RR	G	S	RR	G	U
CAMP CREEK	24	.85	G	RR	G	S	RR	G	S	RR	G	U	RR	E	U
CLARKS FORK	24	.40	?	RR	?	?	RR	?	?	RR	?	?	RR	?	?
LICK CREEK	24	.40	F	RR	F	S	RR	F	S	RR	F	U	NG	F	U
LICK CREEK	24	2.05	G	RR	G	S	RR	G	S	RR	G	U	RR	E	U
RANCHERIA	24	.90	G	RR	G	U	RR	G	U	RR	G	U	RR	G	U
RANCHERIA	24	.80	F	RR	F	U	RR	F	U	RR	F	U	RR	F	U
SALT CREEK	24	.50	G	RR	G	S	RR	G	S	RR	G	U	RR	G	U
SALT CREEK	24	.80	E	RR	E	S	RR	E	S	RR	E	S	RR	E	U
SALT CREEK	24	.50	G	RR	G	S	RR	G	S	RR	G	U	RR	E	U
TITANIC	24	.90	G	RR	G	S	RR	G	S	RR	G	U	RR	G	U
TITANIC	24	.40	?	RR	?	?	RR	?	?	RR	?	?	RR	?	?
TWINCHERIA	24	.60	F	RR	P	D	NG	F	U	NG	F	U	NG	F	U
TWINCHERIA	24	.20	P	RR	P	D	RR	P	D	RR	F	S	NG	F	U
TWINCHERIA	24	.80	G	RR	G	S	RR	G	S	RR	G	U	RR	G	U
WASSON	24	.50	G	RR	G	S	RR	G	S	RR	G	U	RR	G	U
S. FORK TWINCHERIA	24	.35	F	RR	D	D	RR	P	D	RR	F	S	RR	F	U
S. FORK TWINCHERIA	24	.25	G	RR	G	S	RR	G	S	RR	G	U	RR	G	U
SALT CREEK TRB.	24	.25	G	RR	G	U	RR	G	U	RR	G	U	RR	G	U
SALT CREEK TRB.	24	.55	?	RR	?	?	RR	?	?	RR	?	?	RR	?	?
REESE	27	.25	F	SS	F	D	SS	F	D	SS	F	D	NG	F	U
REESE	29	.45	F	SS	F	D	SS	F	D	SS	F	D	NG	F	U
BEAVER DAM	31	.60	F	SU	P	D	DR	F	S	DR	F	S	NG	F	U
BEAVER DAM	31	.60	G	SU	G	U	DR	G	U	DR	G	U	SP	G	U
BIG BUTTE MAIN	31	.70	F	RR	F	S	NG	F	U	NG	F	U	NG	G	U
BIG BUTTE MAIN	31	.70	G	RR	G	S	SP	G	S	RR	G	S	SP	G	S
BIG BUTTE MAIN	31	.50	E	RR	E	U	SP	E	U	RR	E	U	SP	E	U
BOX	31	.60	G	RR	G	U	RR	G	U	RR	G	U	SP	G	U
DOG	31	.60	F	RR	F	S	RR	F	S	RR	F	U	NG	G	U
DOG	31	.75	G	RR	G	S	RR	G	S	RR	G	S	RR	G	S

Appendix G, Table G-1 Streamside Riparian Habitat - Predicted Trend and Condition (Continued)

				Alt. 1 No Action			Alt. 2 Emphasize Livestock			Alt. 3 Preferred Alternative			Alt. 4 Emphasize Non Livestock		
Streams	Allot	Miles	Exist. Cond.	Grazing System	Cond.	Trend	Grazing System	Cond.	Trend	Grazing System	Cond.	Trend	Grazing System	Cond.	Trend
EIGHTY AVE.	31	.30	F	SU	F	D	NG	F	U	NG	F	U	NG	F	U
EIGHTY AVE.	31	.45	G	SU	G	U	DR	G	U	DR	G	U	NG	G	U
HORSE SHOE	31	.35	F	SU	F	D	NG	F	U	NG	F	U	SP	G	U
HORSE SHOE	31	.40	G	DR	G	U	DR	G	U	DR	G	U	NG	G	U
JACKASS	31	1.20	F	SU	F	D	NG	F	U	NG	F	U	NG	G	U
JACKASS	31	.20	P	SU	P	D	NG	F	U	NG	F	U	NG	G	U
JACKASS	31	.30	G	SU	G	S	SU	G	S	SU	G	U	NG	G	U
LOG	31	.60	G	SU	G	S	DR	G	S	DR	G	S	NG	G	S
MCNEIL	31	.50	G	RR	G	S	RR	G	S	RR	G	S	RR	G	S
MULE	31	.70	G	SU	G	S	DR	G	S	DR	G	U	NG	G	U
MULE	31	.10	P	SU	P	D	DR	P	D	DR	F	S	NG	G	U
NORTH FORK BR. BT	31	.90	F	SU	F	S	DR	F	S	DR	F	U	NG	G	U
NORTH FORK BR. BT	31	.50	G	RR	G	U	RR	G	U	RR	G	U	NG	G	U
PARSNIP	31	1.20	G	SU	G	S	DR	G	S	DR	G	U	NG	G	U
ROUND MTN.	31	.30	F	SU	F	S	DR	F	S	DR	F	U	NG	G	U
S. FORK BIG BUTTE	31	.45	E	RR	E	S	RR	E	S	RR	E	S	RR	E	S
S. FORK BIG BUTTE	31	.45	G	SU	G	U	DR	G	U	DR	G	U	NG	G	U
VINE MAPLE	31	1.60	G	SU	G	S	DR	G	S	DR	G	U	NG	G	U
S. FORK VINE MAPLE	31	.65	E	SU	E	U	DR	E	U	DR	E	U	NG	E	U
CLARK CREEK	31	.50	G	RR	G	S	RR	G	S	RR	G	S	RR	G	S
CLARK CREEK	31	1.50	F	SU	F	S	DR	F	S	DR	F	S	NG	G	U
CLARK CREEK	31	.70	G	SU	G	U	DR	G	U	DR	G	U	NG	G	U
CLARK CREEK TRAIL	31	.75	G	SU	G	S	DR	G	S	DR	G	S	NG	G	S
N. FORK CLARK CREEK	31	.10	G	SU	G	U	DR	G	U	DR	G	U	NG	G	U
N. FORK CLARK CREEK	31	.40	E	SU	E	S	DR	E	S	DR	E	S	NG	E	S
N. FORK CLARK CREEK	31	.20	?	SU	?	?	DR	?	?	DR	?	?	NG	?	?
S. FORK CLARK CREEK	31	.50	G	SU	G	S	DR	G	S	DR	G	S	NG	G	S
INDIAN CREEK	35	1.25	G	SP	G	S	DR	G	S	SD	G	U	SP	G	U
HUNGRY	UNA	.25	?	NG	?	?	NG	?	?	NG	?	?	NG	?	?
LEWIS	UNA	.80	F	NG	P	D	NG	P	D	NG	F	S	NG	G	U
MORAINE	UNA	.40	E	NG	E	S	NG	E	S	NG	E	S	NG	E	S
MORAINE	UNA	.30	F	NG	F	S	NG	F	S	NG	F	S	NG	G	U
MORAINE	UNA	.40	G	NG	G	S	NG	G	S	NG	G	S	NG	G	S
BRUSH	UNA	.55	E	NG	E	U	NG	E	U	NG	E	U	NG	F	U
BRUSH	UNA	.20	G	NG	G	U	NG	G	U	NG	G	U	NG	G	U
COLD	103	.30	F	SU	F	S	SU	F	S	SU	F	S	NG	G	U
JOHNSON	103	1.10	E	SU	E	U	SU	E	U	SU	E	U	SU	E	U
JOHNSON	104	2.25	G	SU	G	S	SU	G	S	SU	G	S	SU	G	S
GRIZZLY	106	.10	G	SP	G	S	SP	G	S	SP	G	S	SP	G	S
GRIZZLY	106	.50	F	SP	P	D	SP	P	D	SP	F	S	NG	F	U
FALL	107	.30	F	SU	F	S	SU	F	S	SU	F	S	NG	G	U
FALL	107	.60	G	SU	G	U	SU	G	U	SU	G	U	NG	G	U
JENNY	107	.80	F	SU	F	S	SU	F	S	SU	F	S	MG	F	S
LONG PRAIRIE	107	.50	G	SU	G	U	SU	G	U	SU	G	U	NG	G	U
SHORT SPRING	107	.50	G	SU	G	S	SU	G	S	SU	G	S	NG	G	S
SPRING CREEK	107	.60	F	SU	F	S	SU	F	S	SU	F	S	NG	G	U
SPRING CREEK	107	.10	G	SU	G	U	SU	G	U	SU	G	U	NG	G	U
SPRING CREEK TR. #1	107	.10	E	SU	E	U	SU	E	U	SU	E	U	NG	E	U
SPRING CREEK TR. #2	107	.25	E	SU	E	U	SU	E	U	SU	E	U	NG	E	U
JENNY CREEK	108	.80	P	SS	P	D	SS	P	D	SS	P	D	NG	F	U
JENNY CREEK	108	.80	G	SS	G	S	SS	G	S	SS	G	S	SS	G	U
JENNY CREEK	108	.20	F	SS	P	D	SS	P	D	SS	P	D	NG	F	U
BALDY	110	.50	G	DR	G	S	DR	G	S	DR	G	S	NG	G	U
BEAVER	110	.35	G	DR	G	S	DR	G	S	DR	G	S	NG	G	U
CAMP	110	1.00	?	DR	?	?	DR	?	?	DR	?	?	NG	?	?
CAMP	110	.40	F	DR	F	S	DR	F	S	DR	F	S	NG	G	U
CAMP	110	1.40	G	DR	G	S	DR	G	S	DR	G	S	NG	G	U
CORRAL CREEK	110	.30	G	DR	G	S	DR	G	S	DR	G	S	NG	G	U
CORRAL CREEK	110	.30	F	DR	D	S	DR	P	D	DR	F	S	NG	F	U
DUTCH OVEN	110	1.20	G	DR	G	S	DR	G	S	DR	G	S	NG	G	U
EMIGRANT	110	.75	G	DR	G	S	DR	G	S	DR	G	S	NG	G	U
GREEN MT.	110	.20	G	DR	G	U	DR	G	U	DR	G	U	NG	G	U
GREEN MT.	110	.10	F	DR	D	D	DR	P	D	DR	P	D	NG	G	U
JENNY	110	1.00	G	DR	E	U	DR	E	U	DR	E	U	NG	E	U
KEENE CREEK	110	.30	F	DR	F	S	DR	F	S	DR	F	S	NG	G	U
KEENE CREEK	110	.70	E	DR	E	S	DR	E	S	DR	E	S	NG	E	U
KEENE CREEK	110	1.75	G	DR	G	S	DR	G	S	DR	G	S	NG	G	U
LINCOLN CREEK	110	.50	P	DR	P	S	DR	P	S	DR	P	S	NG	F	U
MILL CREEK	110	.50	F	DR	F	S	DR	F	S	DR	F	S	NG	F	U
PURCUPINE	110	1.00	G	DR	G	S	DR	G	S	DR	G	S	NG	G	U
TYLER CREEK	110	.90	G	DR	G	S	DR	G	S	DR	G	S	NG	G	U
TYLER CREEK	110	.45	F	DR	F	S	DR	F	S	DR	F	S	NG	G	U
S. FORK KEENE CREEK	110	.30	?	DR	?	?	DR	?	?	DR	?	?	NG	?	?
S. FORK LT. BUTTE	113	.25	G	SS	G	U	SS	G	U	SS	G	U	SS	G	U
S. FORK LT. BUTTE	113	.60	F	SS	F	S	SS	F	S	SS	F	S	NG	G	U
SODA (LT. BT. CR(N)	113	1.00	E	SS	E	U	SS	E	U	SS	E	U	SS	E	U
SODA (LT. BT. CR(N)	113	1.60	G	SS	G	U	SS	G	U	SS	G	U	SS	G	U
SODA CREEK TRAIL	113	.20	E	SS	E	U	SS	E	U	SS	E	U	SS	E	U

Appendix G, Table G-1 Streamside Riparian Habitat - Predicted Trend and Condition (Continued)

				Alt. 1 No Action			Alt. 2 Emphasize Livestock			Alt. 3 Preferred Alternative			Alt. 4 Emphasize Non Livestock		
Streams	Allot	Miles	Exist. Cond.	Grazing System	Cond.	Trend	Grazing System	Cond.	Trend	Grazing System	Cond.	Trend	Grazing System	Cond.	Trend
BEAVER CREEK	115	1.70	G	SU	G	U	DR	G	U	DR	G	U	NG	G	U
BEAVER CREEK	115	.20	F	SU	F	S	DR	F	U	DR	F	U	NG	F	U
BEAVER CREEK	115	.20	P	SU	P	S	DR	F	S	DR	F	U	NG	F	U
DEAD INDIAN	115	.65	F	SU	P	D	DR	F	S	DR	F	S	NG	F	U
DEAD INDIAN	115	.20	G	SU	G	U	DR	G	U	DR	G	U	NG	G	U
GRIZZLY	115	.60	G	SU	G	U	DR	E	U	DR	E	U	NG	G	U
JENNY CREEK	115	1.90	G	SU	F	D	DR	F	S	DR	F	S	NG	G	U
JENNY CREEK	115	.20	G	SU	E	U	DR	E	U	DR	E	U	NG	E	U
KEENE CREEK	115	.80	G	SU	G	S	DR	G	U	DR	G	U	NG	G	U
KEENE CREEK	115	.30	F	SU	F	S	DR	F	S	DR	F	S	NG	F	U
SODA CREEK	115	.75	F	SU	F	S	DR	F	S	DR	F	S	NG	F	S
WILLOW CREEK	115	.10	F	SU	F	S	DR	F	S	DR	F	S	NG	G	U
WILLOW CREEK	115	.20	G	SU	E	S	DR	G	S	DR	F	S	NG	F	U
CONDE	117	.25	P	SU	P	D	DR	F	S	DR	F	S	NG	F	U
CONDE	117	.25	F	SU	F	S	DR	F	U	DR	F	U	NG	G	U
CONDE	117	.50	F	SU	P	D	DR	F	S	DR	F	S	NG	F	U
SODA CR. LT. BT. CR	117	.80	G	SU	G	U	DR	G	U	DR	G	U	NG	G	U
DEAD INDIAN	117	.30	G	SU	G	S	DR	G	U	DR	G	U	NG	G	U
LAKE CREEK	121	.10	P	SP	P	D	RR	F	S	RR	F	S	NG	F	S
LOST CREEK	122	1.60	G	SU	G	S	SU	G	S	SU	G	S	SU	G	S
LOST CREEK	122	.60	E	SU	E	U	SU	E	U	SU	E	U	SU	E	U
LOST CREEK	122	.65	P	SU	P	S	SU	P	S	SU	P	S	NG	F	U
DEER	124	.80	G	SS	G	S	SS	G	S	SS	G	S	SS	G	S
LOST	124	.60	E	SS	E	S	SS	E	S	SS	E	S	SS	E	S
SODA (LT. BT. CR.)	124	.50	E	SS	E	U	SS	E	U	SS	E	U	SS	E	U
SODA TR.	124	.20	E	SS	E	U	SS	E	U	SS	E	U	SS	E	U
N. F. L. BT. CR.	126	.50	G	SS	E	U	SS	E	U	SS	E	U	SS	E	U
S. F. L. BT. CR.	129	.20	G	SP	G	S	SR	G	S	SP	G	S	SP	G	S
LAKE CREEK	129	1.00	G	SP	G	S	SR	G	S	SP	G	S	SP	G	S
SPENCER	147	1.35	F	SU	P	D	SU	P	D	SU	P	D	NG	G	U
SPENCER	147	.50	G	SU	G	U	SU	G	U	SU	G	U	SU	G	U
SPENCER TR.	147	1.00	?	SU	?	?	SU	?	?	SU	?	?	SU	?	?
CLOVER CREEK	147	.10	F	SU	P	D	SU	P	D	SU	P	D	NG	F	U
CLOVER CREEK	147	.40	P	SU	P	D	SU	P	D	SU	P	D	NG	F	U
COVE	143	.10	F	SU	P	D	SU	P	D	SU	P	D	NG	F	U
COVE	143	.25	P	SU	P	D	SU	P	D	SU	P	D	NG	F	U
ANTELOPE	143	.80	G	SU	G	U	SU	G	U	SU	G	U	NG	G	U
ANTELOPE	143	.20	F	SU	P	D	SU	P	D	SU	P	D	NG	F	U

KEY:

Grazing System

SS = **Spring/Summer**
DR = **Deferred Rotation**
RR = **Rest Rotation**
NG = **No Grazing**
SU = **Summer**
SP = **Spring**
UNA = **Unalloted**

Trend

U = Up
D = Down
S = Static
? = Unknown

Condition

E = Excellent
G = Good
F = Fair
P = Poor
? = Unknown

Appendix G, Table G-2 Fishery Habitat - Predicted Condition and Trend

Stream [1]	Public Stream Miles	Allot.	Alternative #1 (No Action)					Alternative #2 (Emphasize Livestock)						Alternative #3 (Preferred Alternative)						Alternative #4 (Emphasize Non-Livestock Values)					
			Grazing System	Habitat Trend [2]	Cond. [3] (Miles) G	G/F	F	Grazing System	Miles of Riparian Exclos.	Habitat Trend [2]	Cond. [3] (Miles) G	G/F	F	Grazing System	Miles of Riparian Exclos.	Habitat Trend [2]	Cond. [3] (Miles) G	G/F	F	Grazing System	Miles of Riparian Exclos.	Habitat Trend [2]	Cond. [3] (Miles) G	G/F	F
Elk Creek	1.65	1	SP	U	--	1.65	--	RR	.25	U	.10	1.55	--	DR	.25	U	.10	1.55	--	SP	.25	U	.10	1.55	--
Lost Creek	.50	1	SP	D	--	.25	.25	RR	.50	S	.25	--	.25	DR	.50	S	.25	--	.25	SP	.50	S	.25	--	.25
E Fk W Br Elk Creek	1.10	2	SU	S	.90	.20	--	SU	--	S	.90	.20	--	SU	--	S	.90	.20	--	SP	.25	S	.90	.20	--
W. Branch Elk Creek	2.85	13	SS	U	1.35	1.00	.50	SS	--	U	1.35	1.00	.50	SS	--	U	1.35	1.00	.50	SP	.45	U	1.35	1.00	.50
Lick Creek	2.45	24	RR	D	1.70	.50	.25	RR	--	S	1.70	.50	.25	RR	--	U	1.70	.50	.25	SP	.75	S	2.45	--	--
N Fk Big Butte Cr	4.70	24	RR	U	1.50	3.20	--	RR	.10	U	1.60	3.10	--	RR	.10	U	1.60	3.10	--	SP	.10	U	1.60	3.10	--
Rancheria Creek	1.70	24	RR	U	.30	1.40	--	RR	.25	U	.30	1.40	--	RR	.25	U	.30	1.40	--	SP	.25	U	.30	1.40	--
Salt Creek	1.80	24	RR	S	1.30	.50	--	RR	.25	S	1.30	.50	--	RR	.25	S	1.30	.50	--	SP	.25	S	1.30	.50	--
S Fk Twincheria Cr	.60	24	RR	U	--	--	.60	RR	.55	U	--	--	.60	RR	.55	U	--	--	.60	SP	.55	U	--	--	.60
Big Butte Creek	1.90	31	RR	S	.30	1.60	--	SP	.70	S	.30	1.60	--	RR	.70	S	.30	1.60	--	SP	.70	S	.30	1.60	--
Eighty Acre Creek	.75	31	SU	S	--	.50	.25	DR	.25	U	.25	.50	--	DR	.25	U	.25	.50	--	SP	.25	U	.25	.50	--
Horseshoe Creek	.75	31	SU	D	.25	.50	--	DR	.35	S	.60	.15	--	DR	.35	S	.60	.15	--	SP	.35	S	.60	.15	--
Jackass Creek	1.70	31	SU	U	.70	1.00	--	SU	1.05	U	1.70	--	--	SU	1.05	U	1.70	--	--	SP	1.05	U	1.70	--	--
N Fk Big Butte Cr	1.50	31	SU	U	1.00	.50	--	DR	.25	U	1.00	.50	--	DR	.25	U	1.00	.50	--	SP	.25	U	1.00	.50	--
Parsnip Creek	1.20	31	SU	D	--	1.20	--	DR	.25	D	.25	.95	--	DR	.25	D	.25	.95	--	SP	.25	D	.25	.95	--
Grizzly Creek	.60	106	DR	S	--	--	.60	DR	--	S	--	--	.60	DR	--	S	--	--	.60	DR	.50	U	--	.50	.10
Fall Creek	.90	107	SU	D	--	.30	.60	SU	--	S	--	.30	.60	SU	--	U	--	.30	.60	SU	.35	U	.35	.30	.25
Jenny Creek	.80	107	SU	D	--	--	.80	SU	--	S	--	--	.80	SU	--	U	--	--	.80	SU	.80	U	--	.80	--
Spring Creek	.70	107	SU	S	--	.25	.45	SU	--	S	--	.25	.45	SU	--	U	.25	--	.45	SU	.60	U	.25	--	.45
Jenny Creek	1.80	108	SS	S	1.30	--	.50	SS	--	S	1.30	--	.50	SS	--	S	1.30	--	.50	SS	.85	U	1.30	.50	--
Camp Creek	2.80	110	DR	S	--	1.10	1.70	DR	--	S	--	1.10	1.70	DR	--	S	--	1.10	1.70	NG	--	S	--	1.10	1.70
Corral Creek	.60	110	DR	D	--	--	.60	DR	--	S	--	--	.60	DR	--	U	--	--	.60	NG	--	U	.60	--	--
Dutch Oven Cr	1.20	110	DR	S	.40	.80	--	DR	--	S	.40	.80	--	DR	--	S	.40	.80	--	NG	--	S	.40	.80	--
Jenny Creek	1.30	110	DR	S	1.30	--	--	DR	--	S	1.30	--	--	DR	--	S	1.30	--	--	NG	--	S	1.30	--	--
Keene Creek	2.45	110	DR	S	2.20	.25	--	DR	--	S	2.20	.25	--	DR	--	U	2.20	.25	--	NG	--	U	2.45	--	--
Lincoln Creek	.50	110	DR	S	.50	--	--	DR	--	S	.50	--	--	DR	--	S	.50	--	--	NG	--	S	.50	--	--
Mill Creek	.50	110	DR	D	--	.50	--	DR	--	D	--	.50	--	DR	--	D	--	.50	--	NG	--	D	--	.50	--
Tyler Creek	1.35	110	DR	D	.35	1.00	--	DR	--	D	.35	1.00	--	DR	--	D	.35	1.00	--	NG	--	D	.35	1.00	--
Dead Indian Creek	.85	115	SU	S	--	--	.85	DR	--	U	--	--	.85	DR	--	U	--	--	.85	NG	--	U	.85	--	--
Keene Creek	1.10	115	SU	S	--	.80	.30	DR	--	S	--	.80	.30	DR	--	U	--	.80	.30	NG	--	U	--	1.10	--
Willow Creek	.30	115	SU	S	--	.30	--	DR	--	S	--	.30	--	DR	--	S	--	.30	--	NG	--	S	.10	.20	--
Conde Creek	1.00	117	SU	S	.25	.25	.50	DR	--	U	.25	.25	.50	DR	--	U	.50	.25	.25	DR	.75	U	.50	.25	.25
Dead Indian Creek	.30	117	SU	S	--	--	.30	DR	--	S	--	--	.30	DR	--	S	--	--	.30	DR	0.30	S	--	--	.30
Lost Creek	3.45	124	SS	S	--	2.40	1.05	SS	--	S	--	2.40	1.05	SS	--	S	--	2.40	1.05	SS	0.55	S	--	2.40	1.05
Cove Creek	.35	143	SU	S	--	--	.35	SU	--	S	--	--	.35	SU	--	S	--	--	.35	SU	0.35	U	--	.35	--
Clover Creek	.50	147	SU	S	--	--	.50	SU	--	S	--	--	.50	SU	--	S	--	--	.50	SU	0.50	S	--	--	.50
Spencer Creek	1.85	147	SU	S	.75	1.10	--	SU	--	S	.75	1.10	--	SU	--	S	.75	1.10	--	SU	1.35	U	1.55	.30	--
Antelope Creek	1.00	UNA	--	S	--	--	1.00	--	--	S	--	--	1.00	--	--	S	--	--	1.00	--	1.00	S	--	--	1.00
	51.35				**16.35**	**23.05**	**11.95**				**18.65**	**21.00**	**11.70**				**19.15**	**20.75**	**11.45**				**23.10**	**21.30**	**6.95**

[1] This list includes streams that have significant livestock-related problems. The remaining 57 miles of Class 1 and 2 stream presently lack significant impacts from livestock grazing and none are anticipated under any alternative.

[2] and [3] Refer to Appendix G for methodology for determining stream habitat condition and trend.

Key:	Grazing System	Condition		Trend
SP	Spring grazing	G	Good	S - Static
SS	Spring/summer grazing	G/F	Good to Fair	U - Up
SU	Summer grazing	F	Fair	D - Down
DR	Deferred rotation grazing			
RR	Rest rotation grazing			
NG	No grazing in pasture or allotment			

Appendix H

Estimates of Gross Sales, Personal Income, and Employment

These measures of the economic effects of changes in program-related activities were estimated by use of an input-output model (IMPLAN) developed by the U. S. Forest Service, with which BLM developed the model representing the economy of Jackson and Klamath Counties.

An interindustry (or input-output) model is a summary of all the transactions occurring in an area during a 1-year period, showing for each industry or economic sector the amount of its purchases from every other industry (inputs) and the amount of its sales to every other industry (outputs). Purchases of goods to be sold by trade industries are treated as direct sales by the producing industry, and trade industry transactions are limited to their gross margin accounts, or the part of their transactions over and above the cost of goods sold. This information represents the interindustry relationships in the area and permits the estimation of how a change in one industry would affect other industries and the economy as a whole.

When a specific change occurs in the economy, such as an increase in cattle sales due to increased forage availability, the cattle industry purchases more from its suppliers, ranch families spend more and so on. Recipients of these purchases increase their purchases. The end result of this process is increased activity throughout the economy. The effects on the industry in which the initial change occurs (e.g., the cattle industry) are termed the direct effects of the change. The direct effects plus the effects on other industries in the local economy make up the total local effects. Estimates of the effects per unit measure are shown in Table H-1. Table H-2 shows how the value of livestock sales per AUM was estimated.

Table H-1 Economic Effects Per Unit Measure [1] (1982 dollars)

Activity	Unit	Initial Sales Value	Local Personal Income	Local Employment
Livestock production:				
Livestock industry [2]	AUM	$27.54	$ 4.3045	.0001218
EIS Area	AUM	27.54	19.9607	.0005645
Hunting:				
Big game	HD	26.59	8.1989	.0003664
Small game	HD	15.94	7.3351	.0003663
Waterfowl	HD	22.70	6.5809	.0002884
Freshwater Fishing	AD	14.30	5.5616	.0002485
Range Improvements	DOL	1.00	.7769	.0000262

[1] The values for income and employment shown here represent the amounts generated in Jackson and Klamath Counties by a unit change in the activity specified. Livestock sales value estimates are derived from Table H-2. Recreational expenditure values are derived from USDI, BLM, 1983c. The effects estimated by the IMPLAN model have been adjusted to exclude induced effects on the government sector and to inflate income effects to 1982 price levels.
[2] Effects on livestock industry are direct effects only.

Key to Units:

AUM = Animal Unit Month
HD = Hunter Day
AD = Angler Day
DOL = Dollars

Table H-2 Value of Cattle and Calves Sold Per AUM (Amounts in thousands except values per AUM)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
						Value Per AUM	
Year	Cattle & Calves	Beef Cows	Dairy Cows	Total AUM For Beef Cattle	Value Of Cattle And Calves Sold	In Current Dollars	In 1982 Dollars
1976	148	56.0	5.7	1,258	$22,472	$17.86	$26.57
1977	140	43.5	5.6	1,135	22,224	19.58	29.18
1978	137	57.5	5.4	1,199	23,551	19.64	23.01
1979	148	58.8	5.5	1,274	46,407	36.43	36.08
1980	156	66.0	5.7	1,366	35,797	36.21	26.73
1981	160	68.5	5.8	1,406	33,420	23.77	24.71
1982	170	72.0	5.9	1,487	39,434	26.52	26.52
Average sales per AUM (1982 dollars)							$27.54

Note: Columns 2, 3, 4 and 6 obtained from Oregon State University Extension Service, Commodity Data Sheets, 1983. Column 5 derived as 12 times the number of beef and dairy cows plus 6 times the number of beef calves: 12 x (col. 2 + col. 4) + 6 x (col. 2 - col. 3 - col. 4). Column 7 derived as col. 6 divided by col. 5. Column 8 represents column 7 adjusted to 1982 level of producer price index for livestock: 1976 - 173.3; 1977 - 173.0; 1978 - 220.1; 1979 - 260.3; 1980 - 252.7; 1981 - 248.0; 1982 - 257.8.

Glossary

Active Preference - That portion of the total grazing preference for which grazing use may be authorized.

Active Use - The total number of AUMs authorized for grazing by livestock. Also called paid use.

Actual Use - See active use.

Allotment - An area of land where one or more operators graze their livestock. Generally consists of public land but may include parcels of private or state lands. The number of livestock and season of use are stipulated for each allotment. An allotment may consist of one or several pastures.

Allotment Management Plan (AMP) - An intensive livestock grazing management plan dealing with a specific unit of rangeland, based on multiple use resource management objectives. The AMP considers livestock grazing in relation to the renewable resources — soil, water, vegetation and wildlife. An AMP establishes the season of use, the number of livestock to be permitted on the range and the range improvements needed.

Allowable Cut - The amount of forest products that may be harvested annually or periodically from a specified area over a stated period in accordance with the objectives of management.

Anadromous Fish - Pertaining to fishes that spend a portion of their life in the ocean but enter freshwater to spawn and generally exhibit extensive migrations; e.g. salmon, steelhead, and Pacific lamprey.

Animal Unit Month (AUM) - The amount of forage required to sustain one cow with one calf, or their equivalent, for one month.

Archeologic Resources - All physical evidence of past human activity, other than historical documents, which can be used to reconstruct lifeways and cultural history of past peoples. These include sites, artifacts, environmental data and all other relevant information.

Area of Critical Environmental Concern (ACEC) - An area within the public lands where special management attention is required to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources or other natural systems or processes, or to protect life and safety from natural hazards (FLPMA Sec. 103(a)).

Browse - That part of leaf and twig growth of shrubs, woody vines and trees available for animal consumption.

Carrying Capacity - The maximum number of animals an area can sustain without inducing damage to vegetation or related resourses, such as soil and water.

Characteristic Landscape - The visual characteristics of existing landscape features (including man-made) within a physiographic province. The term does not necessarily mean naturalistic character but rather could refer to landscapes which exhibit both physiographic and land use similarities.

Class 1 Stream - One that provides habitat for salmon, steelhead and/or large numbers of trout. It almost always has an extensive riparian zone associated with it.

Class 2 Stream - One that provides habitat for resident trout but not for anadromous fish. It almost always has an extensive riparian zone associated with it.

Class 3 Stream - One that does not support fish but which normally flows year long except during periods of extreme drought. It usually exhibits a significant amount of riparian vegetation but which is typically less extensive than on Class 1 and 2 streams.

Class 4 Stream - A stream that flows most of the year but ceases to flow during summer months. It may or may not have a significant riparian zone.

Class 5 Stream - A stream that flows only during and immediately after periods of precipitation or the melting of snow.

Contrast Rating - A method of determining the extent of visual impact for an existing or proposed activity that would modify any landscape feature.

Coordinated Resource Management Plan (CRMP) - As used by the U. S. Soil Conservation Service, a plan which indicates interrelated conservation practices and management techniques to maintain or improve soil, water, plant and related resources and provide planning assistance to livestock operators whose units include privately owned land as well as public land administered by the BLM and U. S. Forest Service.

Critical Growing Period - The portion of a plant's growing season, generally between flowering and seed dissemination, when carbohydrate reserves are being stored and seeds produced. Grazing after the start of this date is detrimental due to inadequate moisture for supporting further plant growth later in the season.

Crucial Habitat - A relatively small part of an animal's range or habitat which is essential for the animal's existence because it contains special qualities or features (e.g., water holes, winter food and cover, nesting trees, strutting ground, upland meadow).

Cultural Resources - A term that includes resources of paleontologic, archeologic or historic significance which are fragile, limited, and non-renewable portions of the human environment.

Deferred Rotation - As a grazing system, deferred rotation will take place 1-1/2 to 2 months through the growing season every other year. In the alternate year, grazing will take place after seed ripens.

Environmental Education Area - Areas on the public lands used for outdoor education, research, nature observation and similar activities.

Erosion - Detachment and movement of soil or rock fragments by water, wind, ice or gravity.

Exchange-of-Use Agreement - A non-preference type of grazing authorization issued to applicants owning or controlling unfenced and intermingled land within the boundary of an allotment.

Exclosure - An area fenced to exclude livestock and wild horses.

Exclusion - No authorized livestock grazing.

Fecal Coliform - A group of bacteria used as an indicator of sanitary quality in water.

Forage Condition - As it is used in this document, it is a rating given to seedings and coniferous forest sites and expresses the amount of palatable species for herbivore use.

Forage Production - The amount of forage that is produced within a designated period of time on a given area (expressed in AUMs or pounds per acre). This is the proportion of total annual vegetation production which is consumable by livestock on a sustainable basis.

Forb - Any non-grasslike herbaceous plant.

Grazing Capacity - The amount of forage (expressed in Animal Unit Months) which is consumable by livestock on a sustainable basis.

Grazing Preference - See Total Preference.

Greenup - Start of plant growth in spring or fall.

Groundwater - Subsurface water that is in the zone of saturation.

Habitat Diversity - The relative degree or abundance of plant species, communities, habitats or habitat features (e.g. topography, canopy layers) per unit of area.

Herb - A seed-producing plant that does not develop persistent woody tissue.

Herbaceous Plants - Plants having little or no woody tissue.

Indirect Income - Earnings or personal income to workers outside a specified industry generated by production in that industry. For example, personal income to those outside the livestock industry generated by the business and personal expenditures of the livestock industry as well as successive rounds of expenditures which may result in the community.

Infiltration - The flow of water through the soil surface.

Intermittent Stream - A stream or portion of a stream that flows most of the year but ceases to flow during summer months.

Key Species - A plant that is a relatively or potentially abundant species. It should be able to endure moderately close grazing and serve as an indicator of changes occurring in the vegetational complex. The key species is an important vegetative component that, if overused, will have a significant effect on watershed conditions, grazing capacity, or other resource values. More than one key species may be selected on an allotment.

For example, a species may be important for watershed protection and a different species may be important for livestock forage or wildlife forage, etc.

Limiting Factor - A component of the environment which regulates animal populations (e.g., food, water, cover) or plant growth (water availability, stream channel scour, poor soils).

Litter - A surface layer of loose, organic debris, consisting of freshly fallen or slightly decomposed organic materials.

Livestock Forage Production - See Forage Production.

Long Term - Fifteen years after implementation of the decision.

Management Framework Plan (MFP) - Land use plan for public lands which provides a set of goals, objectives and constraints for a specific planning area to guide the development of detailed plans for the management of each resource.

Multiple Use - Management of the public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American people.

National Natural Landmark - Areas designated by the Secretary of the Interior which contain representative examples of the nation's natural history, including terrestrial communities, aquatic communities, landforms, geological features or habitats of native plant and animal species, possessing national significance in illustrating or interpreting the nation's natural heritage.

National Register of Historic Places - Established by the Historic Preservation Act of 1966, the Register is a listing maintained by the National Park Service of architectural, historical, archeologic and cultural sites of local, state or national significance.

Non-Consumptive Use - A use of vegetation which does not consume, alter, or destroy that resource; i.e., sightseeing, photography, hiking, soil protection. As used in this document, it equates to the annual growth of vegetation which is allocated for plant health and vigor and watershed needs, approximately 40 percent of annual production.

O&C Lands - Public lands granted to the Oregon and California Railroad Company and subsequently revested to the United States.

Paleontology - A science dealing with the life of past geological periods as known from fossil remains.

Pasture - A fenced subdivision of a grazing allotment capable of being grazed by livestock independently from the rest of the allotment.

Perennial Stream - A stream or portion of a stream that flows year long. It receives water from precipitation, springs, melting snow and/or groundwater.

Planning Area Analysis (PAA) - A planning document which analyzes the relationship of social and economic data to the physical and biological data presented in a Unit Resource Analysis (URA).

Plant Composition - The proportions of various plant species annual production in relation to the total annual production of all plants on a given area.

Plant Maturity - That point in the growing season when an individual plant species has set seed, stored food reserves and gone into the dormant stage. This time is different for various species.

Plant Vigor - See Vigor.

Proprietor - One who owns and operates their own business; one engaged in economic activity on their own account and not as an employee. Farm or ranch proprietor need not own the land used.

Public Land - Formal name for lands administered by the Bureau of Land Management.

Range Condition - An expression of the status of a plant community based on kinds, proportions, and amounts of species as they resemble the potential plant community for a given range site.

Range Improvement - A structure, action or practice that increases forage production, improves watershed and range condition or facilitates management of the range or the livestock grazing on it.

Range Trend - A measure of the direction of change in range condition.

Research Natural Areas - Areas established and maintained for research and education. The general public may be excluded or restricted where necessary to protect studies or preserve research natural areas. Lands may have: (1) Typical or unusual faunistic or floristic types, associations, or other biotic phenomena, or (2) Characteristic or outstanding geologic, pedologic or aquatic features or processes.

Resident Fish - Pertaining to those species that spend their entire life in freshwater and generally do not migrate far from where they hatch; e.g. resident cutthroat trout, sculpins, and shiners. See also "Anadromous."

Residual Ground Cover - That portion of the total vegetative ground cover (including litter) that remains after the livestock grazing season.

Rest - As used in this statement, refers to deferment of grazing on a range area (pasture) to allow plants to replenish their food reserves.

Rest Rotation - As a grazing system, rest rotation alternates one or more years of rest with other grazing treatments.

Riparian - Related to wet areas associated with streams, lakes, reservoirs, and springs.

Runoff - That portion of the precipitation on a drainage area that is discharged from the area in stream channels.

Sediment Yield - The quantity of sediment transported through a stream cross-section in a given time.

Seral Stage - The relatively transitory communities within a sere.

Short Term - The 10-year period for implementation of the decision.

Spring/Summer Grazing - As a grazing system, allows grazing during the critical growth period every year.

State Historic Preservation Office (SHPO) - The official within each State, authorized by the State at the request of the Secretary of the Interior, to act as a liaison for purposes of implementing the National Historic Preservation Act of 1966.

Structure - The configuration of elements or parts in a forest stand that results in layering or tiering; an increase in layering or tiering leads to an increase in structural diversity.

Thermal Cover - Vegetation or topography that prevents radiational heat loss, reduces wind chill during cold weather, and intercepts solar radiation during warm weather.

Unallotted Lands - Public lands which currently have no authorized livestock grazing.

Unit Resource Analysis (URA) - A BLM planning document which contains a comprehensive inventory and analysis of the physical resources and an analysis of their potential for development, within a specified geographic area.

Upland - All rangelands and forest land other than riparian areas or wetlands.

Upland meadow - An area characterized by dense herbaceous vegetation due to a high water table.

Utilization - The proportion of the current year's forage production that is consumed or destroyed by grazing animals. This may refer either to a single species or to the whole vegetative complex. Utilization is expressed as a percent by weight, height or numbers within reach of the grazing animals. Four levels of utilization are used in this document: light (21-40 percent), moderate (41-60 percent), heavy (61 percent and over).

Vegetation Allocation - In reference to forage, the distribution of the available livestock forage production to the various resource needs such as wildlife, livestock, wild horses and nonconsumptive use.

Vegetation Manipulation - As used in this statement, refers to seeding and brush control range improvements.

Vegetation Type - A grouping of plant communities which have similar dominant plant species.

Vegetative Ground Cover - The percent of the land surface covered by all living and undecomposed remnants of vegetation within 20 feet of the ground.

Vigor - The relative well-being and health of a plant as reflected by its ability to manufacture sufficient food for growth, maintenance and reproduction.

Visual Contrast - The effect of a striking difference in the form, line, color or texture of the landscape features in the area being viewed.

Visual Resource - The land, water, vegetation, animals and other features that are visible on all public lands.

Visual Resource Management (VRM) Classes - The degree of alteration that is acceptable within the characteristic landscape. It is based upon the physical and sociological characteristics of any given homogenous area.

Water Yield - The amount of water discharged in streams.

Wilderness Study Area - A roadless area or island that has been inventoried and found to have wilderness characteristics as described in Section 603 of the Federal Land Policy and Management Act of 1976 and Section 2(c) of the Wilderness Act of 1964.

Work Year - One person working the full-time equivalent of one year.

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